PIONEER®
The Art of Entertainment

Service Manual

ORDER NO.
ARP2295

STEREO CASSETTE DECK

CT-93 KU/CA, HEM, SD

- **Refer to the service manual ARP2216, CT–979.**
- **This manual is applicable to the KU/CA, HEM and SD types.**

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
PIONEER ELECTRONICS OF CANADA, INC. 505 Cochrane Drive, Markham, Ontario L3R 8E3 Canada
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 9120 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911
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1. CONTRAST OF MISCELLANEOUS PARTS

NOTES:
- Parts without part number cannot be supplied.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

The CT-93/KU/CA, HEM and SD types are the same as the CT-979/HEM type with the exception of the following sections.
Nos. in the "Remark" column correspond to the illustration on page 5.

Mark	Symbol & Description	Part No.				Remarks
		CT-979/ HEM type	CT-93/ KU/CA type	CT-93/ HEM type	CT-93/ SD type	
	Main unit	Non supply	Non supply	Non supply	Non supply	
	Power switch unit	Non supply	Non supply	Non supply	Non supply	
	Input VR unit	Non supply	Non supply	Non supply	Non supply	
	Operation unit	Non supply	Non supply	Non supply	Non supply	
	Control unit	Non supply	Non supply	Non supply	Non supply	
	Headphone unit	Non supply	Non supply	Non supply	Non supply	
	Dolby S unit	.....	Non supply	Non supply	Non supply	(139)
⚠	AC Power cord	ADG1036	RDG1016	ADG1036	PDG1013	
⚠	FU703, FU704 Fuse (T2A)	REK-103	.....	REK-103	REK-103	
⚠	FU701, FU702 Audio fuse (T630mA)	REK-098	.....	REK-098	REK-098	
⚠	FU703, FU704 Fuse (1.6A)	.....	REK-074	.....	.....	
⚠	FU701, FU702 Audio fuse (800mA)	.....	REK-079	.....	.....	
⚠	Power transformer (AC220-230/230-240V)	RTT1158	.....	.....	.....	
⚠	Power transformer (AC120V)	.....	RTT1154	.....	.....	
⚠	Power transformer	.....	.....	RTT1155	.....	
⚠	Power transformer (AC110/120-127/220/240V)	.....	.....	.....	RTT1156	
⚠	Voltage selector	.....	.....	.....	PSB1002	
⚠	AC cord spacer	.....	ANG1153	.....	.....	1
⚠	Strain relief	CM-22B	.....	CM-22B	CM-22B	
	Leg assembly	AMR1159	.....	.....	.....	
	Insulator assembly	.....	VXA1257	VXA1257	VXA1257	
	FL filter	RAH1542	RAH1837	RAH1542	RAH1837	
	VR ring	RAT1007	RAT1006	RAT1006	RAT1006	
	Washer	RBF1017	.....	.....	.....	
	Side rubber	REB1094	.....	.....	.....	
	Door lens	RLP1026	RLP1034	RLP1034	RLP1034	
	FL lens	RLP1027	RLP1035	RLP1035	RLP1035	
	Door	RNK1495	RNK1730	RNK1730	RNK1730	
	Front panel assembly	RXX1382	RXX1381	RXX1380	RXX1381	
	Door assembly	RXX1416	RXX1413	RXX1412	RXX1412	
	Mechanism unit	Non supply	.....	.....	.....	
⊙	Mechanism unit	.....	RYM1122	RYM1122	RYM1122	
	Screw	.....	PBA1038	PBA1038	PBA1038	61
	Wood collar	.....	PNW1238	PNW1238	PNW1238	62
	Side panel	.....	RAH1897	RAH1897	RAH1897	63
						64
	Side wood (L)	.....	RMS1017	RMS1017	RMS1017	

Mark	Symbol & Description	Part No.				Remarks
		CT-979/ HEM type	CT-93/ KU/CA type	CT-93/ HEM type	CT-93/ SD type	
	Side wood (R)	.....	RMS1018	RMS1018	RMS1018	65
	Screw	.....	PYC30P100FMC	PYC30P100FMC	PYC30P100FMC	66
	Wood spacer	.....	REC1008	REC1008	REC1008	67
	PCB spacer	.....	Non supply	Non supply	Non supply	(137)
	Unit holder	.....	Non supply	Non supply	Non supply	(138)
	Dolby S name plate	.....	Non supply	Non supply	Non supply	(140)
	Pad (F)	RHA1021	RHA1029	RHA1029	RHA1029	
	Pad (R)	RHA1022	RHA1030	RHA1030	RHA1030	
	Packing case	RHG1276	RHG1275	RHG1274	RHG1274	
	Connection cord with mini plug	.....	PDE-319	.....	PDE-319	
	Connection cord assembly	RDE1002	RDE1013	RDE1013	RDE1013	
	Operating instructions (French, Italian, Dutch, Swedish, Spanish Portuguese)	RRD1109	.....	RRD1109	.....	
	Operating instructions (English, German)	RRE1044	.....	RRE1044	.....	
	Operating instructions (English)	.....	RRB1094	.....	RRB1094	

⊙ MECHANISM UNIT (RYM1122)

The mechanism unit (RYM1122) is the same as the mechanism unit (RYM1107) with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		RYM1107	RYM1122	
	Capstan belt	REB-501	REB1073	
	Capstan belt (A)	REB-509	REB1074	
	Metal holder assembly (A)	RXA1342	RXA1426	
	Metal holder assembly (B)	RXA1343	RXA1427	
	Flywheel assembly	RXA1374	RXA1376	
	Sub-flywheel assembly	RXA1375	RXA1377	
	Pinch roller arm (A) assembly	RXB-877	RXA1238	
	Pinch roller arm (R) assembly	RXB-876	RXA1240	
	Head base assembly	RXX1342	RXX1401	

MAIN UNIT

The main units (for CT-93/KU/CA, HEM and SD types) are the same as the main unit (for CT-979/HEM type) with the exception of the following sections.

Mark	Symbol & Description	Part No.				Remarks
		CT-979/ HEM type	CT-93/ KU/CA type	CT-93/ HEM type	CT-93/ SD type	
	C101, C102	CQSF151J50	RCE1021	RCE1021	RCE1021	
	C103, C104	CFTXA563J	RCE1024	RCE1024	RCE1024	
	C391	.....	CKPUYF103Z25	.....	CKPUYF103Z25	
	C467, C468	CQSA561J50	CQSF561J50	CQSF561J50	CQSF561J50	
	R303, R304	RD1/6PM562J	RD1/6PM622J	RD1/6PM622J	RD1/6PM622J	
	R382	RD1/6PM123J	RD1/6PM202J	RD1/6PM202J	RD1/6PM202J	
	R395	.....	RD1/6PM102J	RD1/6PM102J	RD1/6PM102J	
	VR105, VR106	RCP1017	RCP1080	RCP1080	RCP1080	
	JA41, JA42	.....	RKN1004	.....	RKN1004	

POWER SWITCH UNIT

The power switch units of CT-93/KU/CA, HEM and SD types are the same as that of CT-979/HEM type for the service supply parts.

INPUT VR UNIT

The input VR units (for CT-93/KU/CA and SD types) are the same as the input VR unit (for CT-979/HEM type) with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		CT-979/ HEM type	CT-93/KU/CA and SD types	
	R973, R974 VR971(20K)	RDR1/4PM303J RCV1067	....	

OPERATION UNIT

The operation units (for CT-93/KU/CA, HEM and SD types) are the same as the operation unit (for CT-979/HEM type) with the exception of the following sections.

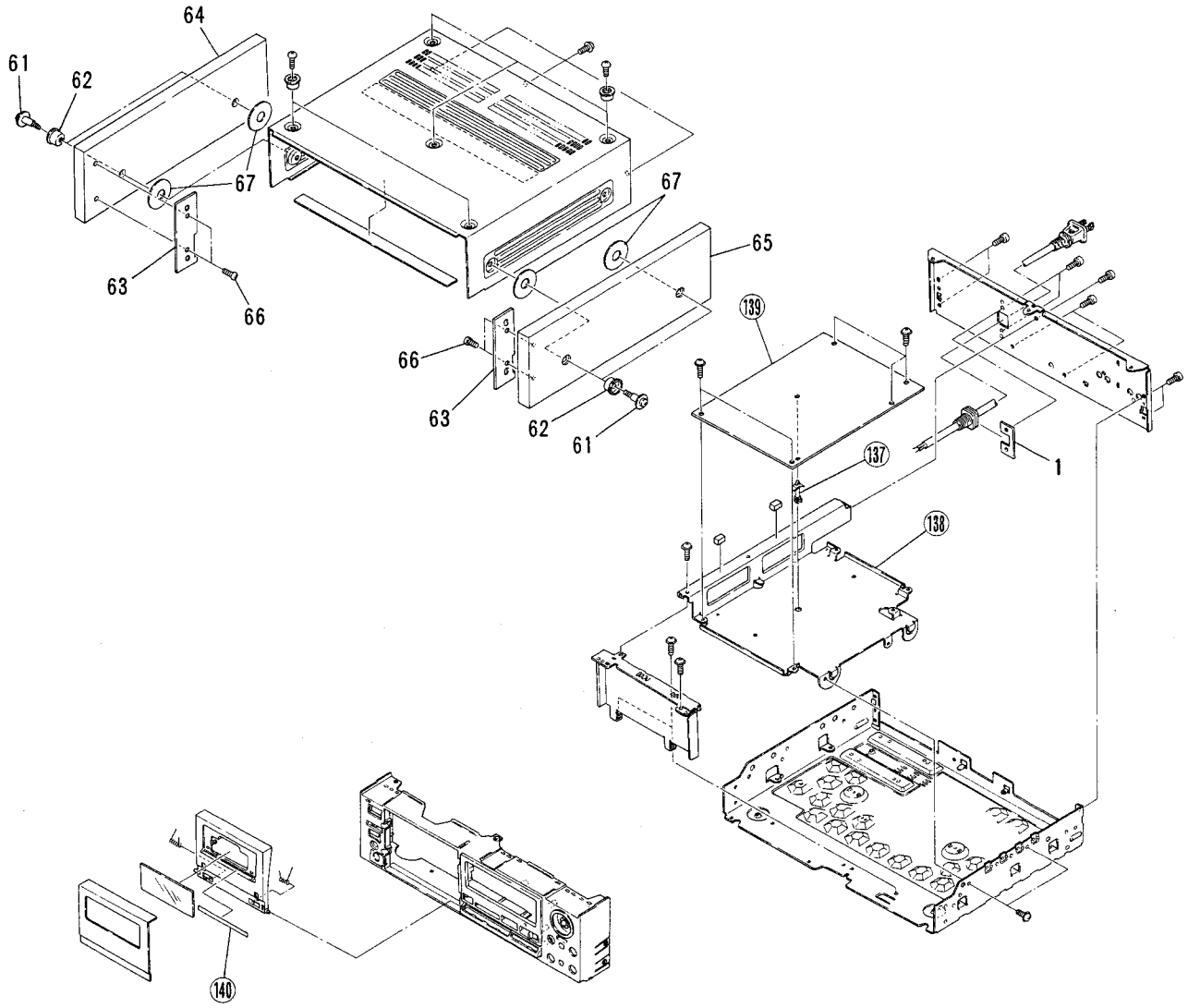
Mark	Symbol & Description	Part No.			Remarks
		CT-979/ HEM type	CT-93/KU/CA and SD types	CT-93/ HEM type	
	D921-D923 S951 R954 R955 V921	..... RSB1001 RD1/6PM223J RAW1056	1SS254 RSB1003 RD1/6PM274J RD1/6PM102J RAW1069	..... RSB1003 RD1/6PM223J RAW1069	

CONTROL UNIT

The control units of CT-93/KU/CA and SD types are the same that of CT-979/HEM type for the service parts.

HEADPHONE UNIT

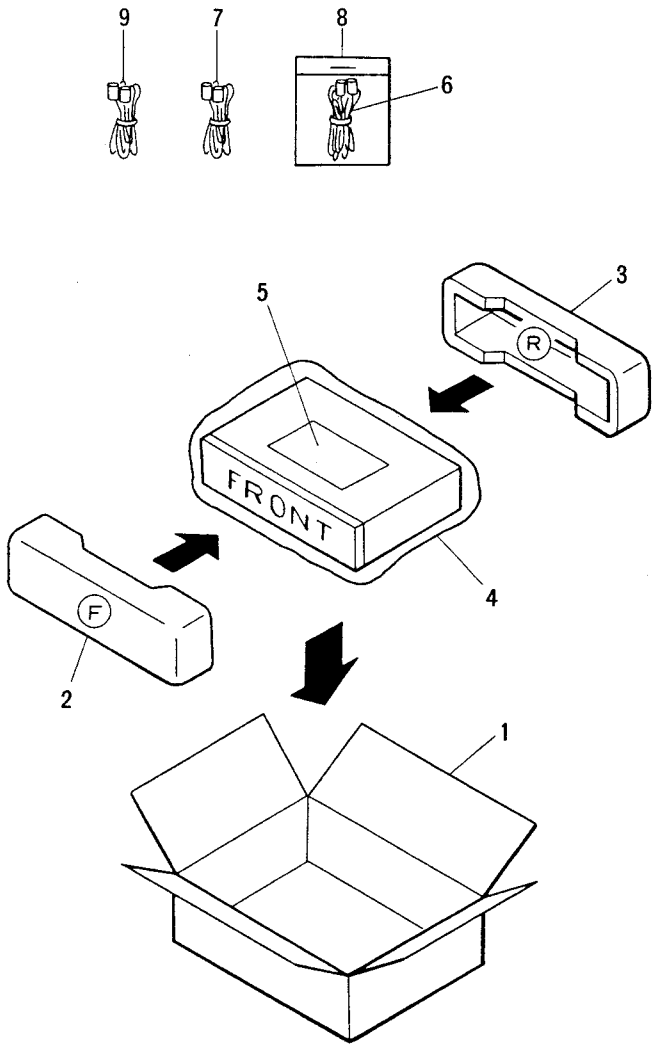
The headphone units of CT-93/KU/CA, HEM and SD types are the same as that of CT-979/HEM type for the service supply parts.


64
61
62
67
63
66
67
65
66
63
62
61
139
137
1
138
140

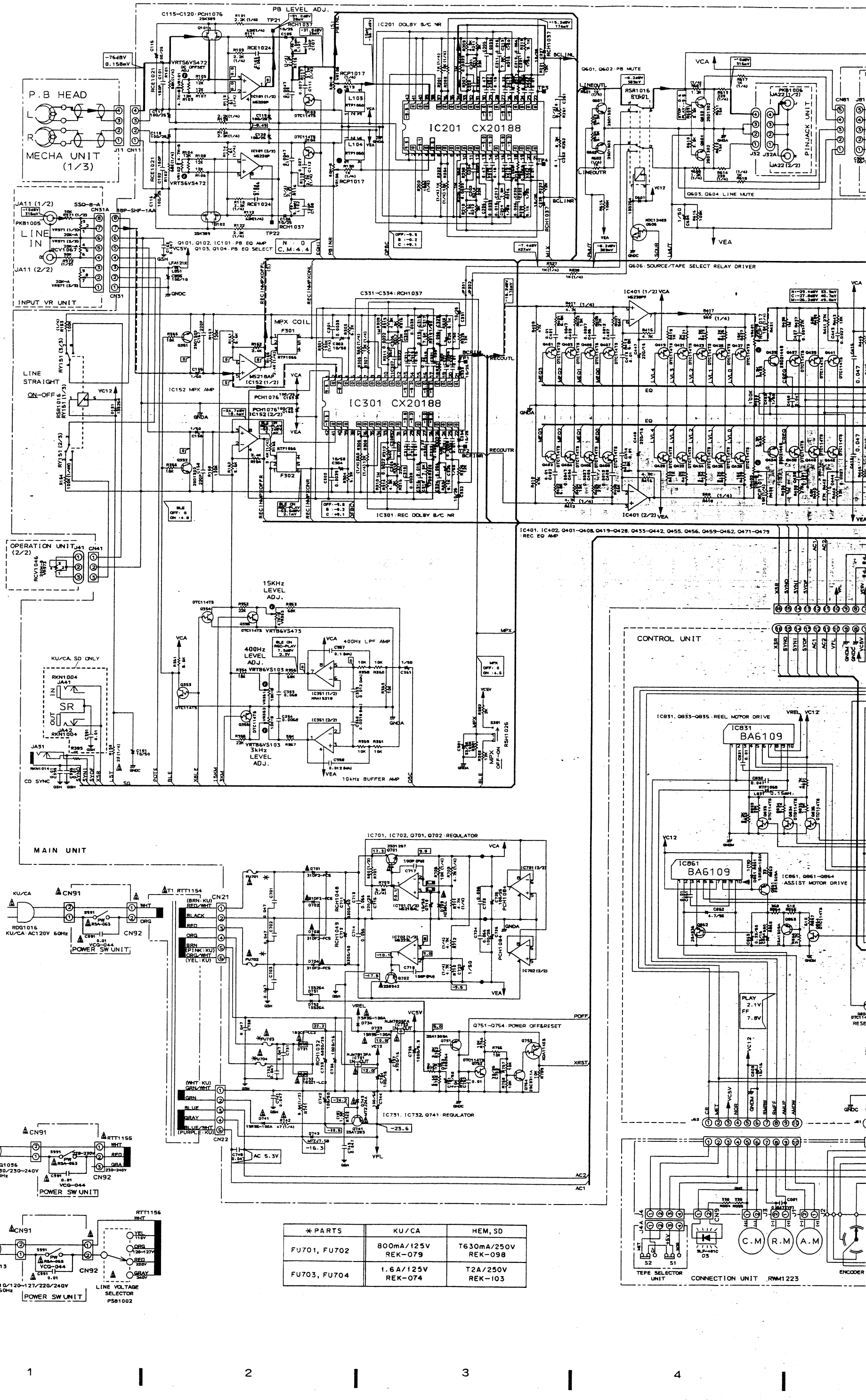
2. PACKING

Parts List

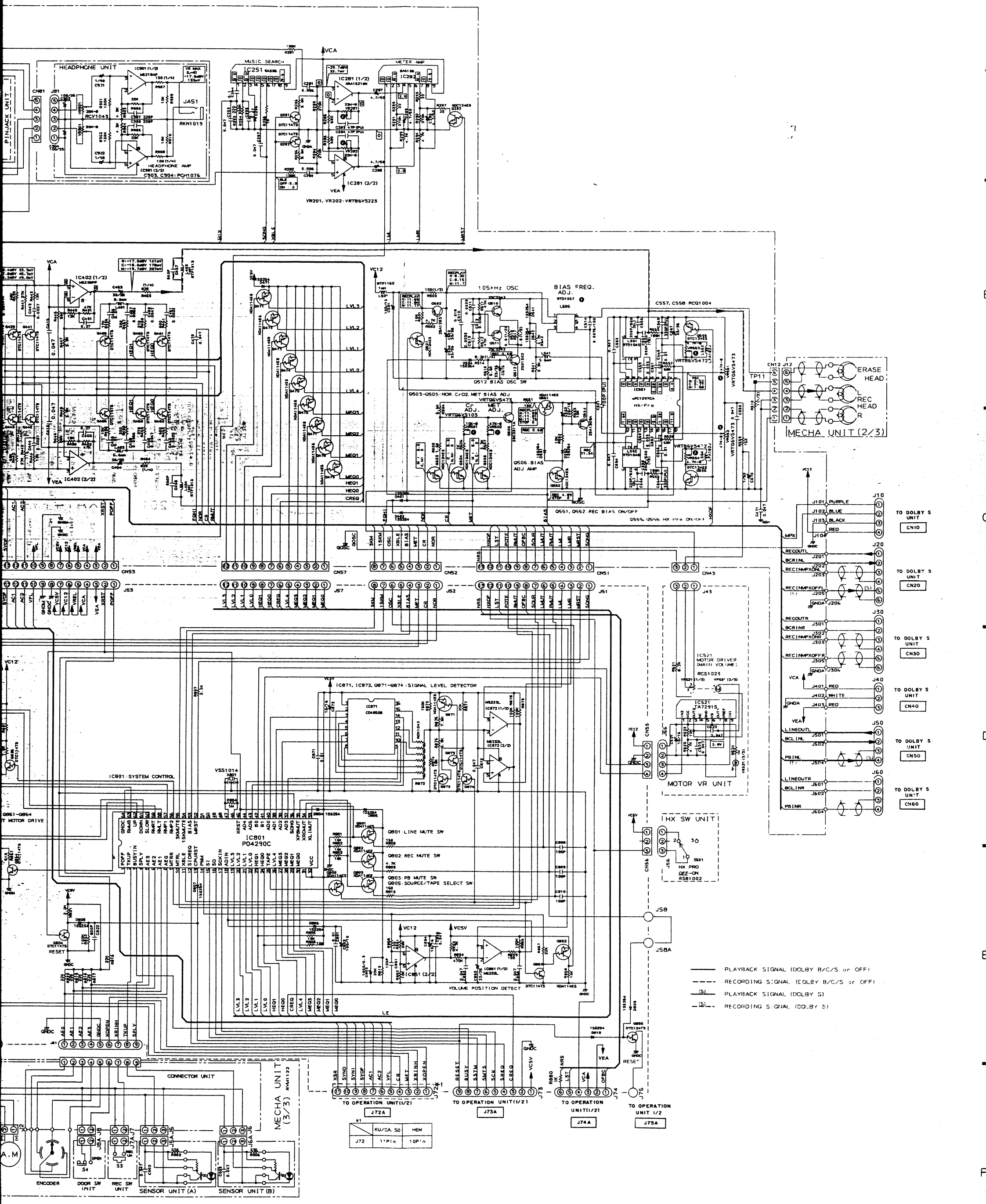
Mark	No.	Description	Part No.
	1	Packing case	RHG1275
	2	Pad (F)	RHA1029
	3	Pad (R)	RHA1030
	4	Mirror mat	Z23 – 030
	5	Operating instructions (English)	RRB1094
	6	Connection cord	RDE – 010
	7	Connection cord with mini plug	PDE – 319
	8	Connection cord assembly	RDE1013
	9	Control cord	RDE1030



3. SCHEMATIC DIAGRAM



*PARTS	KU/CA	HEM, SD
FU701, FU702	800mA/125V REK-079	T630mA/250V REK-098
FU703, FU704	1.6A/125V REK-074	T2A/250V REK-103


HEADPHONE UNIT
PJ/JACK UNIT
CN81
JB1
JA51
RCV1043
RKN1019
HEADPHONE AMP
C303, C304: PCH1076
MUSIC SEARCH
METER AMP
IC251
IC281 (1/2)
IC281 (2/2)
VCA
VEA
VR201, VR202: VRTB6VS223
IC402 (1/2)
IC402 (2/2)
LVL3
LVL2
LVL1
LVL0
HEQ3
HEQ2
HEQ1
HEQ0
CREQ
LVL4
MEQ3
MEQ2
MEQ1
MEQ0
105kHz OSC
BIAS FREQ. ADJ.
RTD1057
Q512 BIAS OSC SW
Q503-Q505: NOR, CrO2, MET BIAS ADJ
Cr ADJ.
MET ADJ.
VRTG6VS473
VRTG6VS103
Q506 BIAS ADJ AMP
Q551, Q552 REC BIAS ON/OFF
Q555, Q556 HX-Pro ON/OFF
C557, C558: RCG1004
VRTB6VS472
IC561
HX-Pro
TP11
ERASE HEAD
L REC HEAD
R
MECHA UNIT (2/3)
J10
J101 PURPLE
J102 BLUE
J103 BLACK
J104 RED
TO DOLBY S UNIT
CN10
J20
RECOUTL
BCRINL
RECINMPXONL
RECINMPXOFFL
GNDA
CN20
J30
RECOUTR
BCRINR
RECINMPXONR
RECINMPXOFFR
CN30
J40
J401 RED
J402 WHITE
J403 RED
CN40
J50
LINEOUTL
BCLINL
PBINL
CN50
J60
LINEOUTR
BCLINR
PBINR
CN60
IC871, IC872, Q871-Q874: SIGNAL LEVEL DETECTOR
IC871
CD4050B
IC872 (1/2)
IC872 (2/2)
IC801: SYSTEM CONTROL
IC801
PD4290C
Q801: LINE MUTE SW
Q802: REC MUTE SW
Q803: PB MUTE SW
Q805: SOURCE/TAPE SELECT SW
Q804
RESET
VOLUME POSITION DETECT
IC851 (1/2)
IC851 (2/2)
IC521
MOTOR DRIVER (MAIN VOLUME)
RCS1025
IC521
TA7291S
MOTOR VR UNIT
HX SW UNIT
HX PRO
DEF-ON
RSB1002
J58
J58A
CONNECTOR UNIT
MECHA UNIT (3/3)
RYM1122
ENCODER
DOOR SW UNIT
REC SW UNIT
SENSOR UNIT (A)
SENSOR UNIT (B)
S4
S3
S5
S6
TO OPERATION UNIT(1/2)
J72A
J73A
J74A
J75A
TO OPERATION UNIT 1/2
*1
KU/CA, SD
HEM
J72
11Pin
10Pin
PLAYBACK SIGNAL (DOLBY B/C/S or OFF)
RECORDING SIGNAL (DOLBY B/C/S or OFF)
PLAYBACK SIGNAL (DOLBY S)
RECORDING SIGNAL (DOLBY S)

DOLBY S UNIT
TP31S
(S)
C1109
10/50
R1154
100
-11.2dBV
R1110
27K
C1111
0.1
R1114
16K
R1115
2.4K
C1119
0.0018
C1121
0.0018
R1120
5.1K
C1115
0.1
C1114
0.022
R1106
30K
(1/10)
C1106
0.0018
R1107
30K
(1/10)
C1110
0.018
R1109
30K
(1/10)
C1113
0.47/50
R1111
30K
(1/10)
R1112
30K
(1/10)
R1128
30K
(1/10)
R1117
20K
(1/10)
R1108
1K
(1/10)
R1101
1K
(1/10)
-11.2dBV
-15.2dBV
NJM4560M-TL
IC1002 (1/2)
BUFFER AMP
CN20
RECOUTL
BCRINL
RECINMPXONL
GNDA
RECINMPXOFFL
GNDA
TO MAIN UNIT
J20
RY1001 (1/2)
RSR1026
R1162
100K
R1163
100K
C1163
10/50
R1165
100
(S)
TP31
RCP1017
VR1101
20K-B
GNDA
-34.5dBV
DOLBY S ENCODER ADJ (Lch)
RY1002 (1/2)
R1161
1K
RSR1026
-31.4dBV
R1156
2.4K
C1162
470P
R1157
120K
(1/10)
-34.5dBV
C1101
10/50
UPC4572G-TR
IC1001 (1/2)
R1101
120K
R1105
15K
(1/2)
R1102
1.1K
(1/2)
IC1101
CXA
MC1IN
MC4IN
MC3IN
IREF
MCBFB
MBBO
HLSMP
HLSOUT
ZL1
ZL2
ZL3
MCTC
LFO
LFIN
TCL1
TCL2
TP32
TP325
BUFFER AMP
IC1002 (2/2)
CN30
RECOUTR
BCRINR
RECINMPXONR
GNDA
RECINMPXOFFR
GNDA
TO MAIN UNIT
J30
RY1001 (2/2)
RSR1026
R1262
100K
R1263
100K
C1263
10/50
R1265
100
RCP1017
VR1201
20K-B
GNDA
DOLBY S ENCODER ADJ (Rch)
RY1002 (2/2)
R1261
1K
RSR1026
R1256
2.4K
C1262
470P
R1257
120K
(1/10)
C1209
10/50
R1254
100
R1210
27K
C1211
0.1
R1214
16K
R1215
2.4K
C1219
0.0018
C1221
0.0018
R1220
5.1K
C1215
0.1
C1214
0.022
R1206
30K
(1/10)
C1206
0.0018
R1207
30K
(1/10)
C1210
0.018
R1209
30K
(1/10)
C1213
0.47/50
R1211
30K
(1/10)
R1212
30K
(1/10)
R1228
30K
(1/10)
R1217
20K
(1/10)
R1208
1K
(1/10)
R1201
1K
(1/10)
IC1001 (2/2)
C1201
10/50
R1201
120K
R1205
15K (1/2)
R1202
1.1K
(1/2)
IC1201
CXA
IC930, Q951–Q956 REGULATOR
VCC
2SK246
Q951
2SD1266
Q955
IC930 (1/2)
NJM5532DD
C951
10/50
D951
HZS6C1L
Q953
2SC2240
DCN1002
R985
10 (1/6)
R981
270
R983
1K
C953
0.056
C955
470/25
RCH1055
CN40
VCA
GNDA
VEA
TO MAIN UNIT
J40
Q954
2SA970
R982
270
R984
1K
C954
0.056
C956
470/25
RCH1055
DCN1002
R986
10 (1/6)
IC930 (2/2)
C952
10/50
D952
HZS6C1L
Q952
2SK246
Q956
2SB941
VEE
TP333
C2104
10/50
R2153
100
R2110
27K
C2111
0.1
R2114
16K
R2115
2.4K
C2119
0.0018
C2121
0.0018
R2120
5.1K
C2115
0.1
C2114
0.022
R2106
30K
(1/10)
C2106
0.0018
R2107
30K
(1/10)
C2110
0.018
R2109
30K
(1/10)
C2113
0.47/50
R2111
30K
(1/10)
R2112
30K
(1/10)
R2128
30K
(1/10)
R2117
20K
(1/10)
R2108
1K
(1/10)
R2101
1K
(1/10)
C2108
0.1
C2117
0.1
R2119
39K
(1/10)
C2120
0.022
C2124
0.039
R2124
10K
(1/10)
-11.2dBV
-35.8dBV
R2103
750
(1/2)
12K
(1/2)
R2104
IC2001 (1/2)
UPC4572G-TR
R2101
120K
IC2101
CXA
NJM4560M-TL
IC2002 (1/2)
BUFFER AMP
-7.5dBV
CN50
LINEOUTL
BCLINL
GNDA
PBINL
TO MAIN UNIT
J50
RY2001 (1/2)
RSR1026
R2162
100K
R2163
100K
C2164
10/50
R2167
100
R2166
68K
TP33
R2164
4.3K
-31.8dBV
BUFFER AMP
IC2003 (1/2)
NJM4560M-TL
R2159
68K
R2161
12K
VR2101
5K-B
RCP1088
R2155
8.2K
L2161
RTF1060
5.6mH
DOLBY S PB LEVEL ADJ (Lch)
TP345
C2204
10/50
R2253
100
R2210
27K
C2211
0.1
R2214
16K
R2215
2.4K
C2219
0.0018
C2221
0.0018
R2220
5.1K
C2215
0.1
C2214
0.022
R2206
30K
(1/10)
C2206
0.0018
R2207
30K
(1/10)
C2210
0.018
R2209
30K
(1/10)
C2213
0.47/50
R2211
30K
(1/10)
R2212
30K
(1/10)
R2228
30K
(1/10)
R2217
20K
(1/10)
R2208
1K
(1/10)
R2201
1K
(1/10)
C2208
0.1
C2217
0.1
R2219
39K
(1/10)
C2220
0.022
C2224
0.039
R2224
10K
(1/10)
R2253
750
(1/2)
12K
(1/2)
R2204
IC2001 (2/2)
R2201
120K
IC2201
CXA
TP34
IC2002 (2/2)
BUFFER AMP
CN60
LINEOUTR
BCLINR
GNDA
PBINR
TO MAIN UNIT
J60
RV2001 (2/2)
RSR1026
R2262
100K
R2263
100K
C2264
10/50
R2267
100
R2266
68K
VCC
IC2003 (2/2)
R2264
4.3K
VEE
BUFFER AMP
R2259
68K
R2261
12K
VR2201
5K-B
RCP1388
R2255
8.2K
L2261
RTF1060
5.6mH
DOLBY S PB LEVEL ADJ (Rch)

CXA1417S Dolby S-type phose 3

D1001-D1003, D2001 :DAN202K-TL

Q1001-Q1004 RELAY DRIVER

CN10 TO MAIN UNIT J10

MPX NRS GNDC VC12

C1151 100/25 RCH1057

C2151 100/25 RCH1057

C1001 10/50

GNDA

GNDC

VC12

(S) PLYBACK SIGNAL (DOLBY B/C or OFF)

(S) RECORDING SIGNAL (DOLBY B/C or OFF)

(S) PLYBACK SIGNAL (DOLBY S)

(S) RECORDING SIGNAL (DOLBY S)

CHIP PARTS

*PARTS	KU/CA.	HEM
R954	270K	22K
R955	1K	JUMPER
D921	1SS254	X
D922	1SS254	X
D923	1SS254	X

*1	KU/CA.	HEM
J72A	11Pin	10Pin

TIMER SW UNIT
S981
PLAY
OFF
REC
J71

TO CONTROL UNIT J72 *1
TO CONTROL UNIT J73
TO CONTROL UNIT J74
TO CONTROL UNIT J75

J71A: T-REC, GNDC, T-PLAY
J72A: XSR, SYNO, SYNI, SYOF, AC1, AC2, VFL, CR, MET, XRINH, XOPEN
J73A: RESET, BUSY, SSTM, SMTS, SCK, SREQ, CREQ, GNDC, VC5V
J74A: NRS, LST, HXOF, VCA, VEAV, OFBC
J75A

Q922: TIMER REC SW
Q923: TIMER PLAY SW

XDA114ES Q922, Q923
XDC114ES Q921
VSS1014
X921 1M
R954* R955* D921* D922* *D923
R956 150, R923 2.2K
R957 22K, D924 1SS254, D925 1SS254, D926 1SS254
R930 270K, R958 100K, R959 100K
R960 100K, R961 100K
R970 100K

IC921
PD3170A
OPERATION CONTROL
NROFF SYNI SYOF NRBI NRCI GND NRSI BLE HXOF T-REC T-PLAY REMAINV BLE TYPE PLCSV CREQ SYNO NRSO BUSY SO SI SCKIN
CR MET XRINH XOPEN SREQ KI3 KI2 KI1 KI0 KO3 KO2 KO1 KO0 VCC

S941
D941 560 R964 SEL2215S
RSG-150
LINE STRAIGHT
OFF—ON

R965 12K, R966 12K, R967 12K
S951 (1/2) S951 (2/2)
S961
RSG1027
SUPER AUTO BLE

R968 5.6K
Q924 XDC114ES
C923 22/35
R969 1M
START /CLEAR

R924 R925 R926 R927 R928 R929 100K
C922 0.01
C921 10/16
RSB1003
DOLBY NR
B—OFF—C—S
Q924: DOLBY NR ON/OFF SW

V921
RAW1069
AC1 AC2 T0 T1 T2 T3 T4 T5 S00 S01 S02 S03 S04 S05 S06 S07 S08 S09 S10 S11 S12 S13 S14 S15 S16
R931 R932 R933 R934 R935 R936 R937 R938 R939 R940 R941 R942 R943 R944 R945 R946 R947 R948 R949 R950 R951 R952 R953 100K

FL
R922 150
Q925 2SC1740S
R921 100K
Q925: FL IND DRIVER

S921 OPEN/CLOSE
S922 REW
S923 TAPE
S924 STOP
S925 COUNTER MODE
S926 RESET
S927 PLAY
S928 METER RANGE
S929 FF
S931 PEAK MODE
S931 REC
S932 DISPLAY
S933 MONITOR SELECT
S934 PAUSE
S935
S936
S921—S936: RSG1023

OPERATION UNIT (1/2)

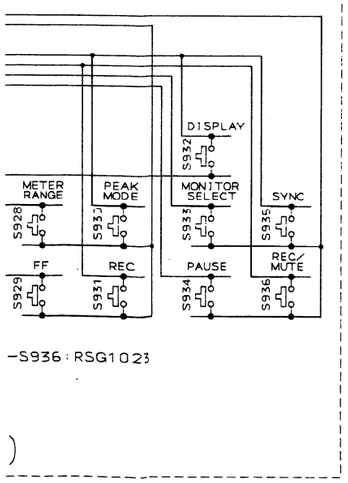
7 8 9

A

B

C

D

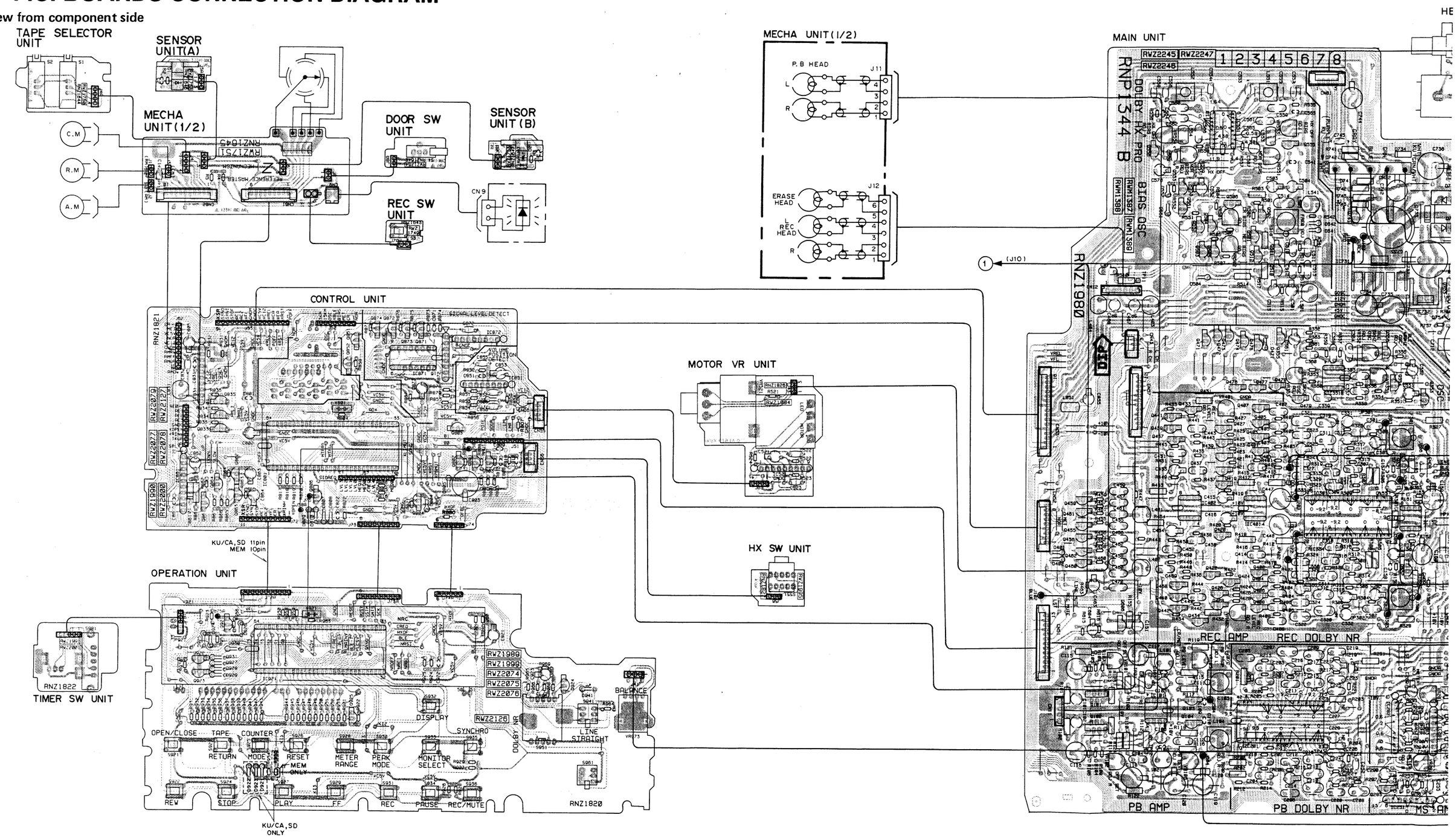


-S936 : RSG1023

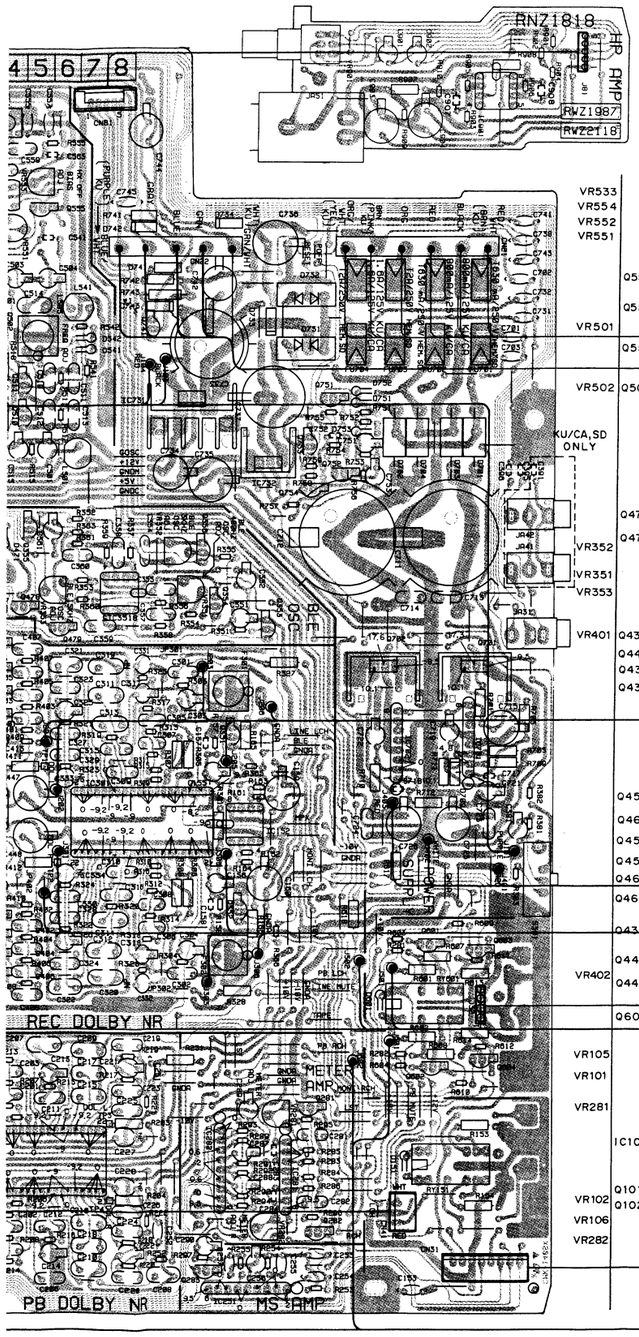
7 8 9 15

4. P.C. BOARDS CONNECTION DIAGRAM

- View from component side

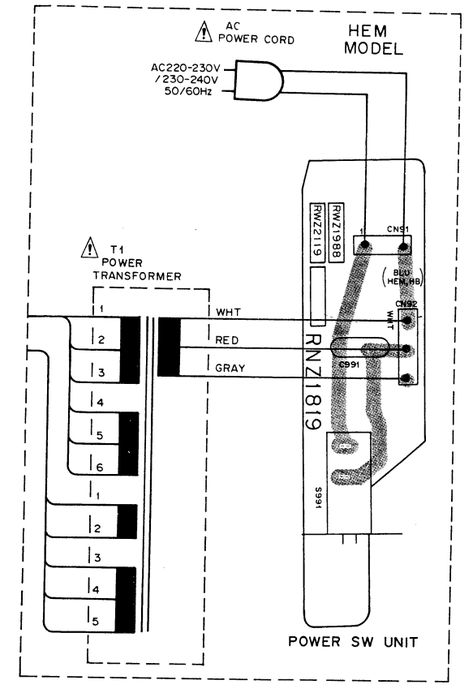


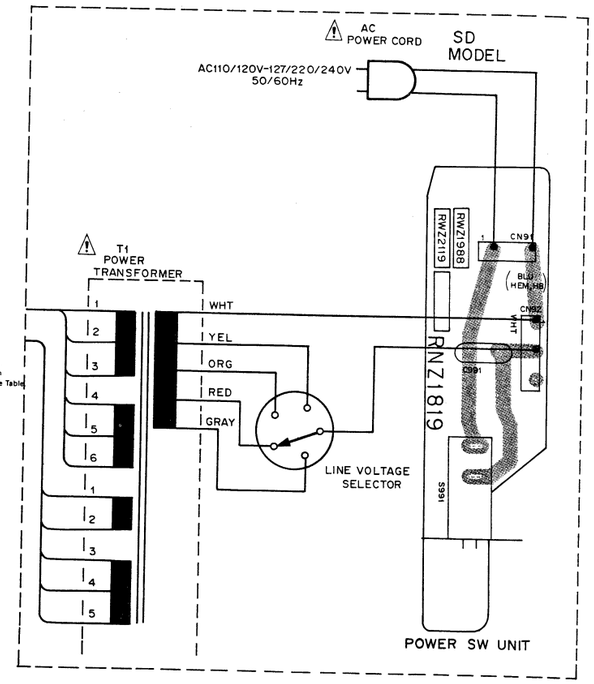
HEADPHONE UNIT



P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor
		FET
		Diode
		Zenner diode
		LED
		Varactor
		Tact switch
		Inductor
		Coil
		Transformer
		Filter
		Ceramic capacitor
		Mylar capacitor
		Styrol capacitor
		Electrolytic capacitor (Non polarized)
		Electrolytic capacitor (Noiseless)
		Electrolytic capacitor (Polarized)
		Electrolytic capacitor (Polarized)
		Power capacitor
		Semi-fixed resistor
		Resistor array
		Resistor
		Resonator
		Thermistor

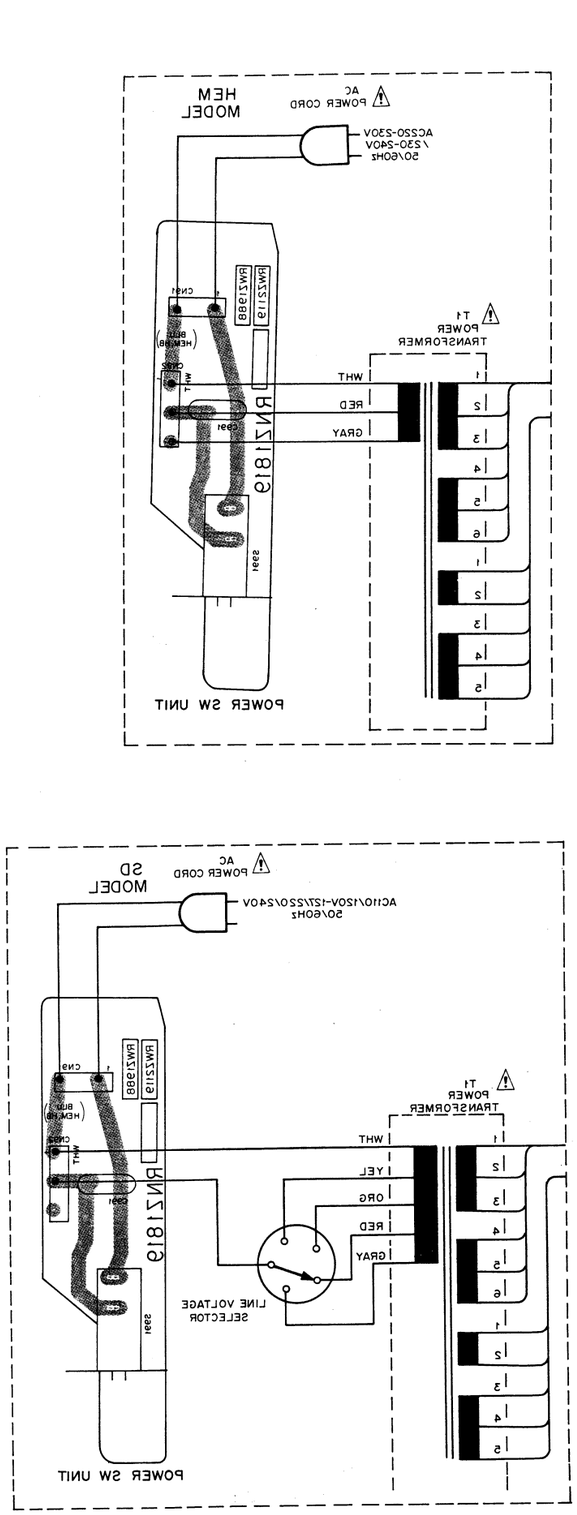
1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with ▭ shows negative terminal.
4. The diode marked with ○ shows cathode side.
5. The transistor terminal marked with ▭ shows emitter.

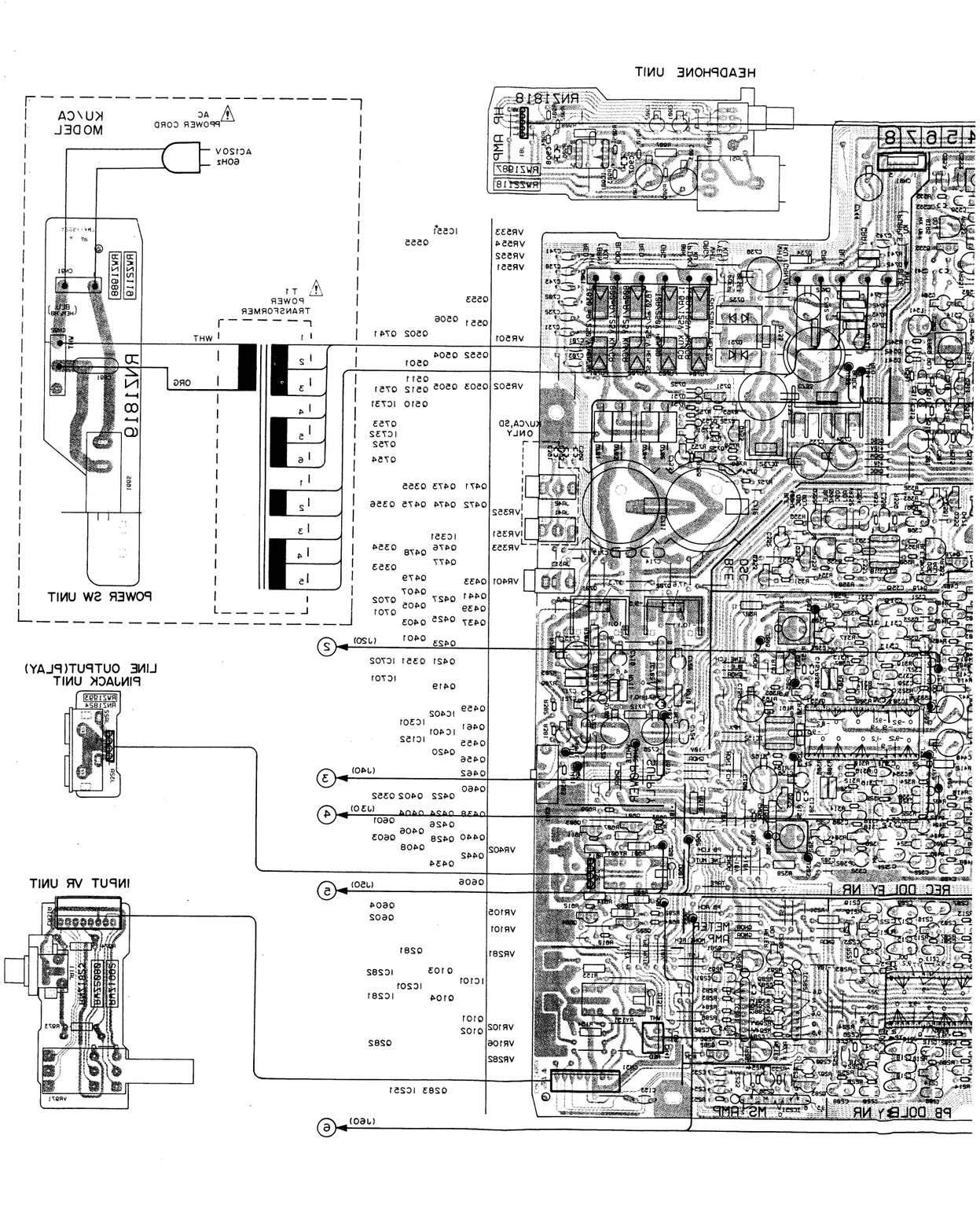




HEM MODEL
AC POWER CORD
AC220-240V 50/60Hz
T1 POWER TRANSFORMER
WHT
RED
GRAY
RN1819
POWER SW UNIT

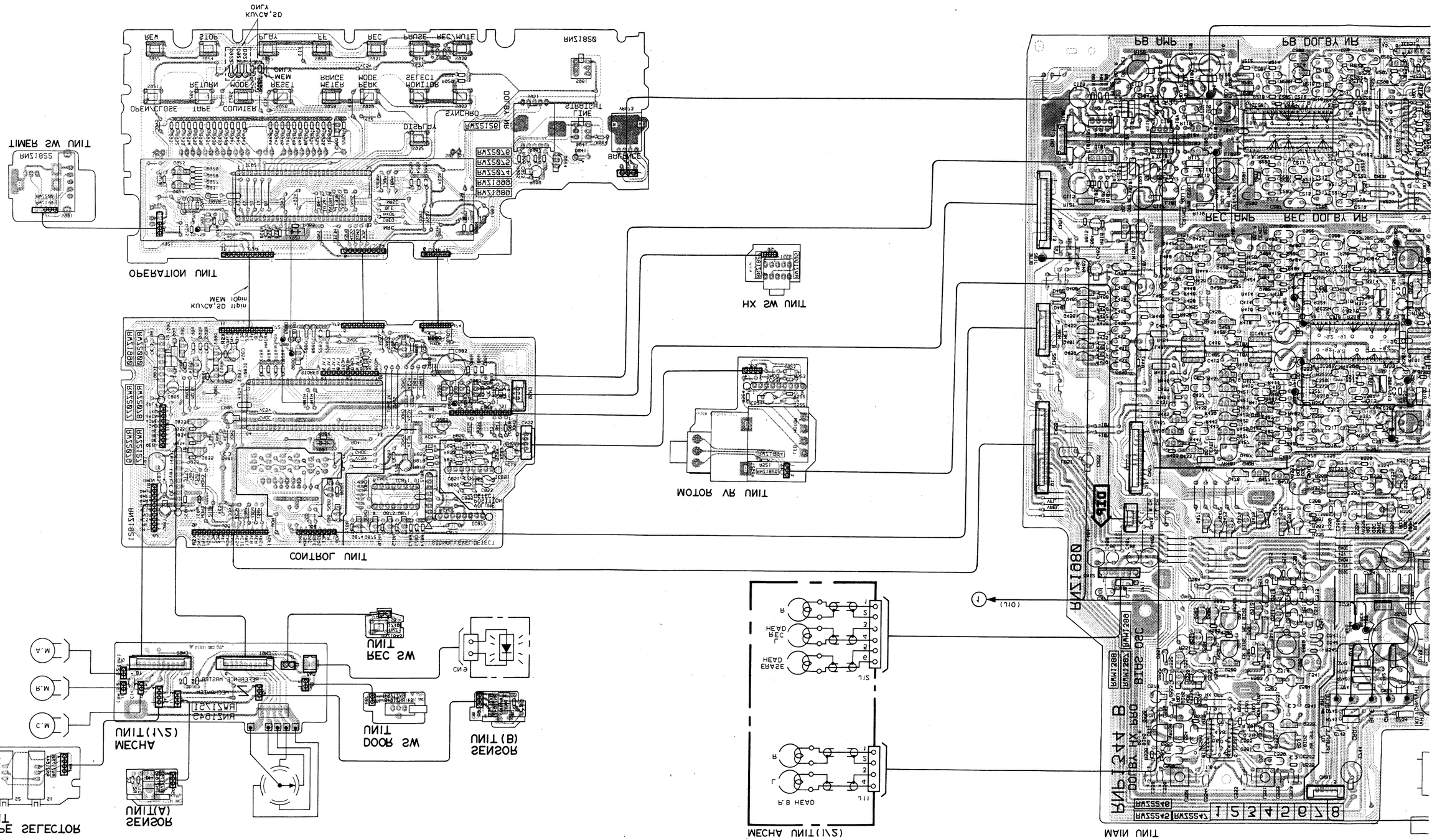
KU/CA MODEL
AC POWER CORD
AC120V 60Hz
T1 POWER TRANSFORMER
WHT
ORG
RN1819
POWER SW UNIT


SD MODEL
AC POWER CORD
AC110/120V-127/220/240V 50/60Hz
T1 POWER TRANSFORMER
WHT
YEL
ORG
RED
GRAY
LINE VOLTAGE SELECTOR
RN1819
POWER SW UNIT


HEADPHONE UNIT
RN1818
LINE OUTPUT(PLAY) PINJACK UNIT
INPUT VR UNIT
KU/CA,SD ONLY
REC DOLBY NR
PB DOLBY NR
METER AMP
MS AMP

4. P.C. BOARDS CONNECTION DIAGRAM

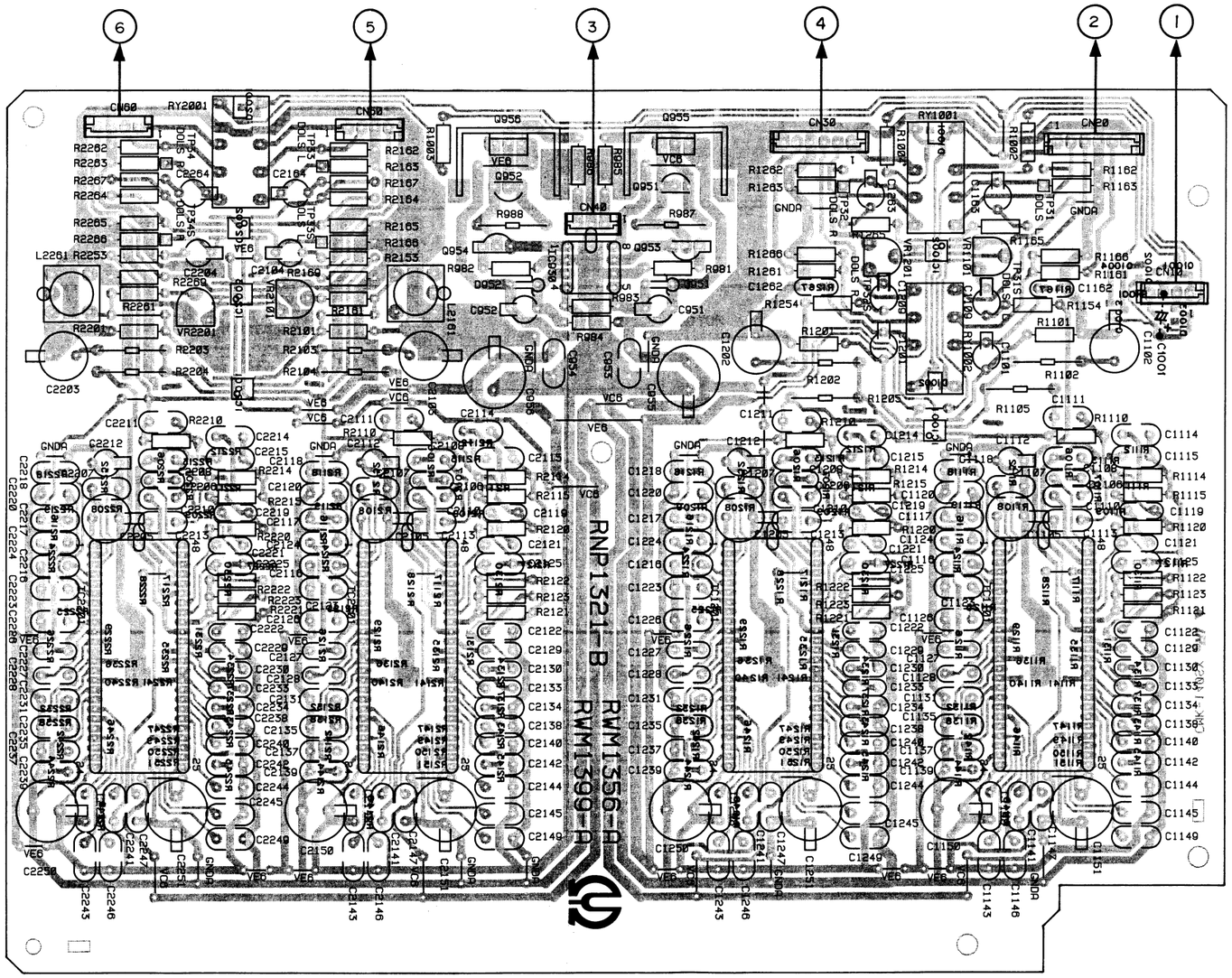
• View from soldering side



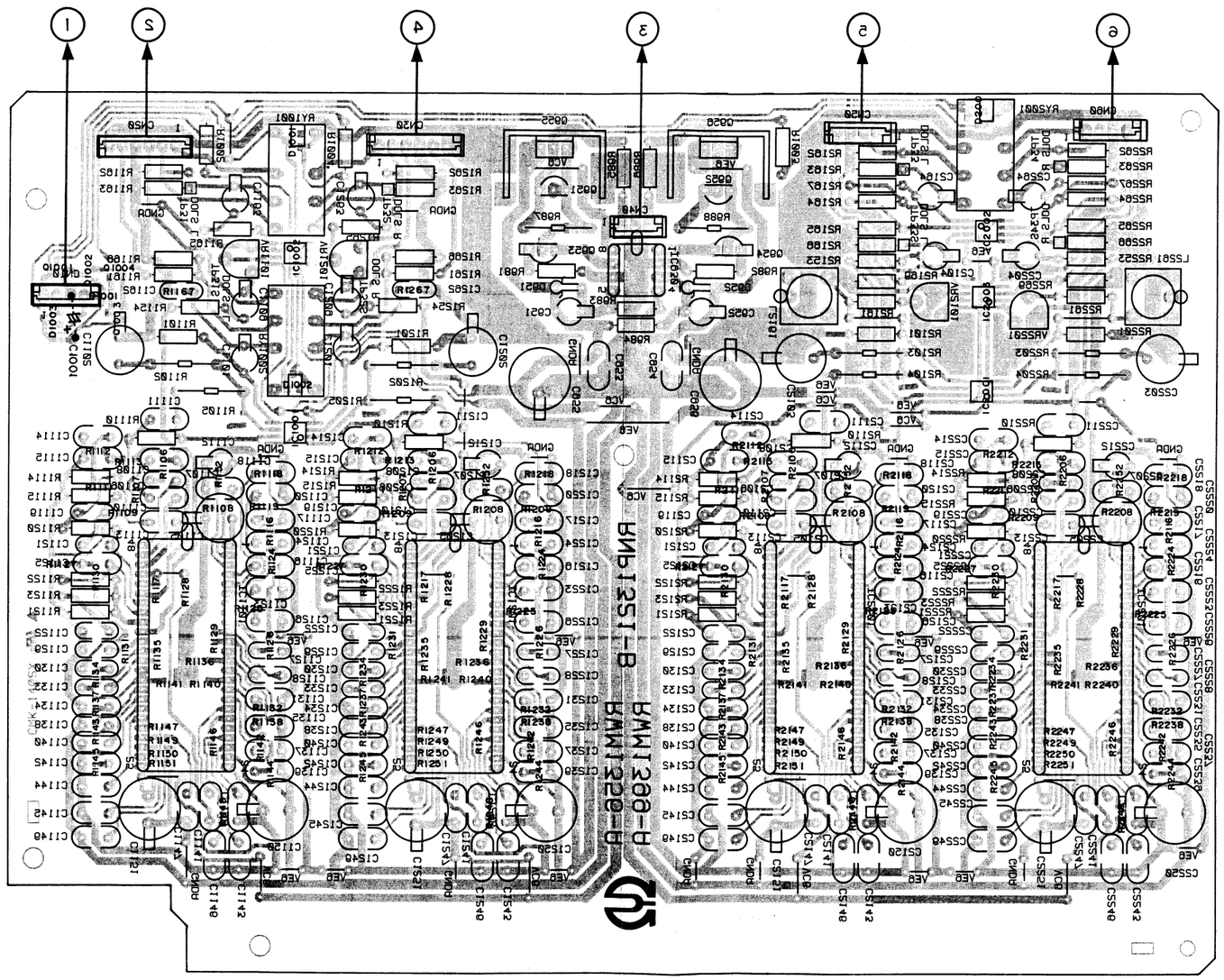
CT-93/KU/CA, HEM, SD

• View from component side

• View from solde



- View from soldering side



5. P.C.B's PARTS LIST

NOTES:

- Parts without part number cannot be supplied.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%)

560 Ω → 56 × 10^1 → 561 ····· RD1/4PS 5 6 1 J
47k Ω → 47 × 10^3 → 473 ····· RD1/4PS 4 7 3 J
0.5 Ω → 0R5 ····· RN2H 0 R 5 K
1 Ω → 010 ····· RS1P 0 1 0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → 562 × 10^1 → 5621 ····· RN1/4SR 5 6 2 1 F

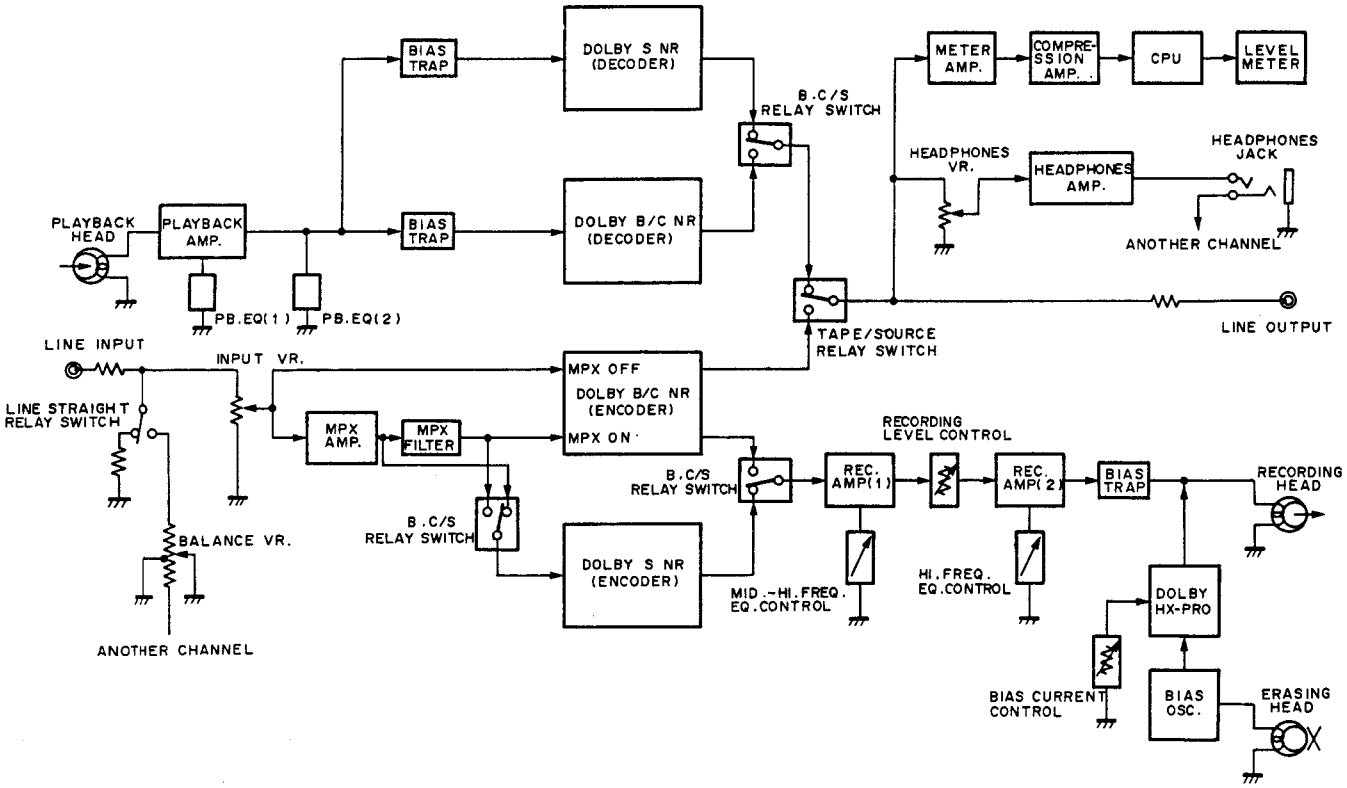
Mark	No.	Description	Part No.
		DOLBY S UNIT	
		This unit is the exclusive board for CT－93/KU/CA, HEM and SD types.	
		SEMICONDUCTORS	
	IC930	OP-AMP IC	NJM5532DD
	IC1001		UPC4572G
	IC1002	OP-AMP IC	NJM4560M
	IC1101		CXA1417S
	IC1201		CXA1417S
	IC2001		UPC4572G
	IC2002, 2003	OP-AMP IC	NJM4560M
	IC2101		CXA1417S
	IC2201		CXA1417S
⚠	Q951, 952	N-FET	2SK246
	Q953	TRANSISTOR	2SC2240
	Q954	TRANSISTOR	2SA970
⚠	Q955	TRANSISTOR	2SD1266
⚠	Q956	TRANSISTOR	2SB941
	Q1001-1004		DTC114EK
	D951, 952	ZENER DIODE	HZS6C1L
	D1001-1003	CHIP DIODE ARRAY	DAN202K
	D2001	CHIP DIODE ARRAY	DAN202K
		RELAYS	
	RY1001, 1002		RSR1026
	RY2001		RSR1026
		COILS/TRANSFORMERS	
	L2161	COIL	RTF1060
	L2261	COIL	RTF1060
		CAPACITORS	
	C951, 952	ELECTR. CAPACITOR(10/50)	RCH1062
	C953, 954	AUDIO FILM CAPACITOR	CFTXA563J50
	C955, 956	ELECTR. CAPACITOR(470/25)	RCH1055
	C1001	ELECTR. CAPACITOR	CEAS100M50
	C1101	ELECTR. CAPACITOR(10/50)	RCH1062
	C1105	ELECTR. CAPACITOR	CENA220M50
	C1106	AUDIO FILM CAPACITOR	CFTXA182J50
	C1107, 1108	AUDIO FILM CAPACITOR	CFTXA104J50
	C1109	ELECTR. CAPACITOR(10/50)	RCH1062
	C1110	AUDIO FILM CAPACITOR	CFTXA183J50
	C1111	AUDIO FILM CAPACITOR	CFTXA104J50
	C1112	ELECTR. CAPACITOR	CENA100M50
	C1113	AUDIO FILM CAPACITOR	CFTXA474J50
	C1114	AUDIO FILM CAPACITOR	CFTXA223J50
	C1115	AUDIO FILM CAPACITOR	CFTXA104J50
	C1116	AUDIO FILM CAPACITOR	CFTXA224J50
	C1117	AUDIO FILM CAPACITOR	CFTXA104J50
	C1118	AUDIO FILM CAPACITOR	CFTXA183J50
	C1119	AUDIO FILM CAPACITOR	CFTXA182J50
	C1120	AUDIO FILM CAPACITOR	CFTXA223J50
	C1121, 1122	AUDIO FILM CAPACITOR	CFTXA182J50
	C1123	AUDIO FILM CAPACITOR	CFTXA224J50
	C1124, 1125	AUDIO FILM CAPACITOR	CFTXA393J50
	C1126	AUDIO FILM CAPACITOR	CFTXA105J50
	C1127		CFTXA681J50
	C1128		CFTXA102J50
	C1129		CFTXA471J50
	C1130	AUDIO FILM CAPACITOR	CFTXA222J50
	C1131	AUDIO FILM CAPACITOR	CFTXA822J50
	C1133		CFTXA102J50
	C1134	AUDIO FILM CAPACITOR	CFTXA822J50
	C1135	AUDIO FILM CAPACITOR	CFTXA224J50
	C1137	AUDIO FILM CAPACITOR	CFTXA823J50
	C1138, 1139	AUDIO FILM CAPACITOR	CFTXA153J50
	C1140	AUDIO FILM CAPACITOR	CFTXA473J50
	C1141	AUDIO FILM CAPACITOR	CFTXA104J50
	C1142	AUDIO FILM CAPACITOR	CFTXA224J50
	C1143	AUDIO FILM CAPACITOR	CFTXA474J50
	C1144	AUDIO FILM CAPACITOR	CFTXA104J50
	C1145	AUDIO FILM CAPACITOR	CFTXA474J50
	C1146	AUDIO FILM CAPACITOR	CFTXA224J50
	C1147	AUDIO FILM CAPACITOR	CFTXA823J50
	C1148	AUDIO FILM CAPACITOR	CFTXA104J50
	C1149	AUDIO FILM CAPADITOR	CFTXA334J50
	C1150, 1151	ELECTR. CAPACITOR(100/25)	RCH1057

Mark	No.	Description	Part No.
	C1162		CFTXA471J50
	C1163	ELECTR. CAPACITOR(10/50)	RCH1062
	C1201	ELECTR. CAPACITOR(10/50)	RCH1062
	C1205	ELECTR. CAPACITOR	CENA220M50
	C1206	AUDIO FILM CAPACITOR	CFTXA182J50
	C1207, 1208	AUDIO FILM CAPACITOR	CFTXA104J50
	C1209	ELECTR. CAPACITOR(10/50)	RCH1062
	C1210	AUDIO FILM CAPACITOR	CFTXA183J50
	C1211	AUDIO FILM CAPACITOR	CFTXA104J50
	C1212	ELECTR. CAPACITOR	CENA100M50
	C1213	AUDIO FILM CAPACITOR	CFTXA474J50
	C1214	AUDIO FILM CAPACITOR	CFTXA223J50
	C1215	AUDIO FILM CAPACITOR	CFTXA104J50
	C1216	AUDIO FILM CAPACITOR	CFTXA224J50
	C1217	AUDIO FILM CAPACITOR	CFTXA104J50
	C1218	AUDIO FILM CAPACITOR	CFTXA183J50
	C1219	AUDIO FILM CAPACITOR	CFTXA182J50
	C1220	AUDIO FILM CAPACITOR	CFTXA223J50
	C1221, 1222	AUDIO FILM CAPACITOR	CFTXA182J50
	C1223	AUDIO FILM CAPACITOR	CFTXA224J50
	C1224, 1225	AUDIO FILM CAPACITOR	CFTXA393J50
	C1226	AUDIO FILM CAPACITOR	CFTXA105J50
	C1227		CFTXA681J50
	C1228		CFTXA102J50
	C1229		CFTXA471J50
	C1230	AUDIO FILM CAPACITOR	CFTXA222J50
	C1231	AUDIO FILM CAPACITOR	CFTXA822J50
	C1233		CFTXA102J50
	C1234	AUDIO FILM CAPACITOR	CFTXA822J50
	C1235	AUDIO FILM CAPACITOR	CFTXA224J50
	C1237	AUDIO FILM CAPACITOR	CFTXA823J50
	C1238, 1239	AUDIO FILM CAPACITOR	CFTXA153J50
	C1240	AUDIO FILM CAPACITOR	CFTXA473J50
	C1241	AUDIO FILM CAPACITOR	CFTXA104J50
	C1242	AUDIO FILM CAPACITOR	CFTXA224J50
	C1243	AUDIO FILM CAPACITOR	CFTXA474J50
	C1244	AUDIO FILM CAPACITOR	CFTXA104J50
	C1245	AUDIO FILM CAPACITOR	CFTXA474J50
	C1246	AUDIO FILM CAPACITOR	CFTXA224J50
	C1247	AUDIO FILM CAPACITOR	CFTXA823J50
	C1248	AUDIO FILM CAPACITOR	CFTXA104J50
	C1249	AUDIO FILM CAPADITOR	CFTXA334J50
	C1250, 1251	ELECTR. CAPACITOR(100/25)	RCH1057
	C1262		CFTXA471J50
	C1263	ELECTR. CAPACITOR(10/50)	RCH1062
	C2104	ELECTR. CAPACITOR(10/50)	RCH1062
	C2105	ELECTR. CAPACITOR	CENA220M50
	C2106	AUDIO FILM CAPACITOR	CFTXA182J50
	C2107, 2108	AUDIO FILM CAPACITOR	CFTXA104J50
	C2110	AUDIO FILM CAPACITOR	CFTXA183J50
	C2111	AUDIO FILM CAPACITOR	CFTXA104J50
	C2112	ELECTR. CAPACITOR	CENA100M50
	C2113	AUDIO FILM CAPACITOR	CFTXA474J50
	C2114	AUDIO FILM CAPACITOR	CFTXA223J50
	C2115	AUDIO FILM CAPACITOR	CFTXA104J50
	C2116	AUDIO FILM CAPACITOR	CFTXA224J50
	C2117	AUDIO FILM CAPACITOR	CFTXA104J50
	C2118	AUDIO FILM CAPACITOR	CFTXA183J50
	C2119	AUDIO FILM CAPACITOR	CFTXA182J50
	C2120	AUDIO FILM CAPACITOR	CFTXA223J50
	C2121, 2122	AUDIO FILM CAPACITOR	CFTXA182J50
	C2123	AUDIO FILM CAPACITOR	CFTXA224J50
	C2124, 2125	AUDIO FILM CAPACITOR	CFTXA393J50
	C2126	AUDIO FILM CAPACITOR	CFTXA105J50
	C2127		CFTXA681J50
	C2128		CFTXA102J50
	C2129		CFTXA471J50
	C2130	AUDIO FILM CAPACITOR	CFTXA222J50
	C2131	AUDIO FILM CAPACITOR	CFTXA822J50
	C2133		CFTXA102J50
	C2134	AUDIO FILM CAPACITOR	CFTXA822J50
	C2135	AUDIO FILM CAPACITOR	CFTXA224J50
	C2137	AUDIO FILM CAPACITOR	CFTXA823J50
	C2138, 2139	AUDIO FILM CAPACITOR	CFTXA153J50
	C2140	AUDIO FILM CAPACITOR	CFTXA473J50
	C2141	AUDIO FILM CAPACITOR	CFTXA104J50
	C2142	AUDIO FILM CAPACITOR	CFTXA224J50
	C2143	AUDIO FILM CAPACITOR	CFTXA474J50
	C2144	AUDIO FILM CAPACITOR	CFTXA104J50
	C2145	AUDIO FILM CAPACITOR	CFTXA474J50
	C2146	AUDIO FILM CAPACITOR	CFTXA224J50
	C2147	AUDIO FILM CAPACITOR	CFTXA823J50
	C2148	AUDIO FILM CAPACITOR	CFTXA104J50
	C2149	AUDIO FILM CAPADITOR	CFTXA334J50
	C2150, 2151	ELECTR. CAPACITOR(100/25)	RCH1057
	C2164	ELECTR. CAPACITOR(10/50)	RCH1062
	C2204	ELECTR. CAPACITOR(10/50)	RCH1062
	C2205	ELECTR. CAPACITOR	CENA220M50
	C2206	AUDIO FILM CAPACITOR	CFTXA182J50
	C2207, 2208	AUDIO FILM CAPACITOR	CFTXA104J50
	C2210	AUDIO FILM CAPACITOR	CFTXA183J50
	C2211	AUDIO FILM CAPACITOR	CFTXA104J50
	C2212	ELECTR. CAPACITOR	CENA100M50
	C2213	AUDIO FILM CAPACITOR	CFTXA474J50
	C2214	AUDIO FILM CAPACITOR	CFTXA223J50
	C2215	AUDIO FILM CAPACITOR	CFTXA104J50
	C2216	AUDIO FILM CAPACITOR	CFTXA224J50
	C2217	AUDIO FILM CAPACITOR	CFTXA104J50
	C2218	AUDIO FILM CAPACITOR	CFTXA183J50
	C2219	AUDIO FILM CAPACITOR	CFTXA182J50
	C2220	AUDIO FILM CAPACITOR	CFTXA223J50
	C2221, 2222	AUDIO FILM CAPACITOR	CFTXA182J50
	C2223	AUDIO FILM CAPACITOR	CFTXA224J50
	C2224, 2225	AUDIO FILM CAPACITOR	CFTXA393J50
	C2226	AUDIO FILM CAPACITOR	CFTXA105J50
	C2227		CFTXA681J50
	C2228		CFTXA102J50
	C2229		CFTXA471J50
	C2230	AUDIO FILM CAPACITOR	CFTXA222J50
	C2231	AUDIO FILM CAPACITOR	CFTXA822J50

Mark	No.	Description	Part No.
	C2233		CFTXA102J50
	C2234	AUDIO FILM CAPACITOR	CFTXA822J50
	C2235	AUDIO FILM CAPACITOR	CFTXA224J50
	C2237	AUDIO FILM CAPACITOR	CFTXA823J50
	C2238, 2239	AUDIO FILM CAPACITOR	CFTXA153J50
	C2240	AUDIO FILM CAPACITOR	CFTXA473J50
	C2241	AUDIO FILM CAPACITOR	CFTXA104J50
	C2242	AUDIO FILM CAPACITOR	CFTXA224J50
	C2243	AUDIO FILM CAPACITOR	CFTXA474J50
	C2244	AUDIO FILM CAPACITOR	CFTXA104J50
	C2245	AUDIO FILM CAPACITOR	CFTXA474J50
	C2246	AUDIO FILM CAPACITOR	CFTXA224J50
	C2247	AUDIO FILM CAPACITOR	CFTXA823J50
	C2248	AUDIO FILM CAPACITOR	CFTXA104J50
	C2249	AUDIO FILM CAPADITOR	CFTXA334J50
	C2250, 2251	ELECTR. CAPACITOR(100/25)	RCH1057
	C2264	ELECTR. CAPACITOR(10/50)	RCH1062
RESISTORS			
	R981-984	CARBONFILM RESISTOR	RDR1/4PM□□□J
⚠	R985, 986	FUSE RESISTOR(10Ω)	DCN1002
	R1001	CHIP RESISTOR	RS1/10S□□□J
	R1101	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R1102	CARBONFILM RESISTOR	RDM1/2P□□□J
	R1105	CARBONFILM RESISTOR	RDM1/2P□□□J
	R1106-1109		RS1/10S□□□J
	R1110	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R1111-1113		RS1/10S□□□J
	R1114, 1115	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R1116-1119	CHIP RESISTOR	RS1/10S□□□J
	R1120-1123	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R1124-1132	CHIP RESISTOR	RS1/10S□□□J
	R1134-1138	CHIP RESISTOR	RS1/10S□□□J
	R1140-1152	CHIP RESISTOR	RS1/10S□□□J
	R1154	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R1161-1163	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R1165, 1166	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R1167	CHIP RESISTOR	RS1/10S□□□J
	R1201	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R1202	CARBONFILM RESISTOR	RDM1/2P□□□J
	R1205	CARBONFILM RESISTOR	RDM1/2P□□□J
	R1206-1209		RS1/10S□□□J
	R1210	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R1211-1213		RS1/10S□□□J
	R1214, 1215	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R1216-1219	CHIP RESISTOR	RS1/10S□□□J
	R1220-1223	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R1224-1232	CHIP RESISTOR	RS1/10S□□□J
	R1234-1238	CHIP RESISTOR	RS1/10S□□□J
	R1240-1252	CHIP RESISTOR	RS1/10S□□□J
	R1254	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R1261-1263	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R1265, 1266	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R1267	CHIP RESISTOR	RS1/10S□□□J
	R2101	CARBONFILM RESISTOR	RDR1/4PM□□□J

Mark	No.	Description	Part No.
	R2103, 2104		RDM1/2P□□□J
	R2106-2109		RS1/10S□□□J
	R2110	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R2111-2113		RS1/10S□□□J
	R2114, 2115	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R2116-2119	CHIP RESISTOR	RS1/10S□□□J
	R2120-2123	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R2124-2132	CHIP RESISTOR	RS1/10S□□□J
	R2134-2138	CHIP RESISTOR	RS1/10S□□□J
	R2140-2152	CHIP RESISTOR	RS1/10S□□□J
	R2153	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R2161-2167	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R2169	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R2201	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R2203, 2204		RDM1/2P□□□J
	R2206-2209		RS1/10S□□□J
	R2210	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R2211-2213		RS1/10S□□□J
	R2214, 2215	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R2216-2219	CHIP RESISTOR	RS1/10S□□□J
	R2220-2223	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R2224-2232	CHIP RESISTOR	RS1/10S□□□J
	R2234-2238	CHIP RESISTOR	RS1/10S□□□J
	R2240-2252	CHIP RESISTOR	RS1/10S□□□J
	R2253	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R2261-2267	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R2269	CARBONFILM RESISTOR	RDR1/4PM□□□J
	VR1101	VARIABLE RESISTOR(20K)	RCP1017
	VR1201	VARIABLE RESISTOR(20K)	RCP1017
	VR2101	VARIABLE RESISTOR(5K)	RCP1088
	VR2201	VARIABLE RESISTOR(5K)	RCP1088

6. BLOCK DIAGRAM



7. ADJUSTMENTS

PLAYBACK SECTION

Playback Level Adjustment

- This adjustment determines the DOLBY NR level, and must be performed with great care.

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	PLAY	Play the 315 Hz/0 dB section of the STD-331B test tape.	Deck	VR105 (Lch) VR106 (Rch)	TP. 3 (Lch) TP. 4 (Rch)	-15.0 dBv	This adjustment must be performed accurately for proper Dolby level setting.
2.			DOLBY S	VR2101 (Lch) VR2201 (Rch)	TP. 33S (Lch) TP. 34S (Rch)	-11.7 dBv	

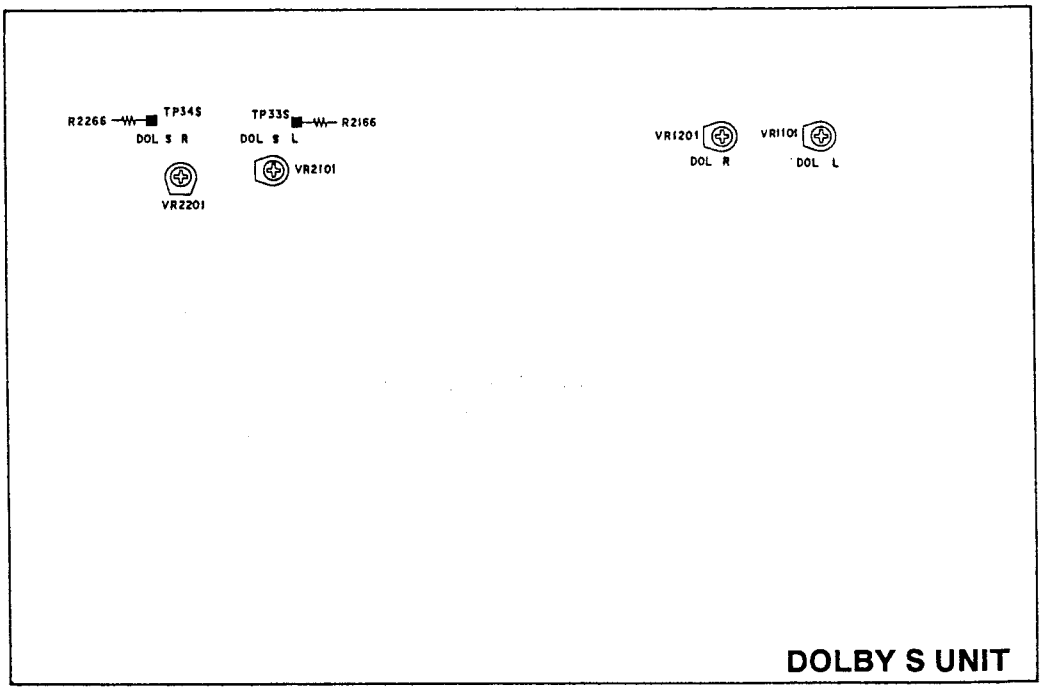


Fig. 7-1 Adjusting points

RECORDING SECTION

Bias Trap Adjustment

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	REC	Load the STD-610 test tape with no input signal.	Deck	L103 (Lch) L104 (Rch)	TP. 3 (Lch) TP. 4 (Rch)	Minimum output	
2.	Set the Dolby NR switch to S.						
3.	REC	Load the STD-610 test tape with no input signal.	DOLBY S	L2161 (Lch) L2261 (Rch)	LINE OUT	Minimum output	

DOLBY S Encoder Adjustment

- DOLBY S encoder adjustment must be performed before recording bias adjustment.

No.	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1.	Turn OFF the DOLBY NR switch.					
2.	REC/ PAUSE	Apply the 315 Hz/–10 dBv signal to the line input terminals.	REC level control volume	TP. 1 (Lch) TP. 2 (Rch)	–15.2 dBv	
3.	Turn the DOLBY NR switch to S position.					
4.	REC/ PAUSE	Apply the 315 Hz/–10 dBv signal to the line input terminals.	VR1101 (Lch) VR1201 (Rch)	TP. 1 (Lch) TP. 2 (Rch)	–14.5 dBv	

Recording Bias Adjustment

- Turn ON the DOLBY HX PRO switch on the front panel, and set the BIAS control to the center position.

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	REC/ PAUSE	Apply a 315 Hz/–20 dBv (–20VU meter reading) signal to the line input terminals and insert STD–630.			LINE OUT		
2.	REC →PLAY	Record and play back the 315 Hz signal and a 10 kHz signal at –20 dBv input level.	NOR	VR551 (L)		Record and play back repeatedly, comparing the 315 Hz and 10 kHz playback levels, and adjust to 0.5 dBv ± 0.5 dB.	
				VR552 (R)			
3.		Record the 10 kHz/315 Hz, –20 dBv signal on STD–620 and play back.	CrO2	VR501 (L/R)		0 dBv ± 1.0 dB	
4.		Record the 10 kHz/315 Hz, –20 dBv signal on STD–610 and play back.	METAL	VR502 (L/R)		0 dBv ± 1.0 dB	
5.	Check distortion value after adjustment is completed and confirm that there is no underbias.						
6.	Set the Dolby NR switch to S.						
7.	REC/ PAUSE	Apply a 315 Hz/–20 dBv (–20VU meter reading) signal to the line input terminals and insert STD–630.			LINE OUT		
8.	REC →PLAY	Record and play back the 315 Hz signal and a 10 kHz signal at –20 dBv input level.	NOR	VR551 (L)		Record and play back repeatedly, comparing the 315 Hz and 10 kHz playback levels, and adjust to 1.5 dBv ± 1.0 dB.	
				VR552 (R)			
9.		Record the 10 kHz/315 Hz, –20 dBv signal on STD–620 and play back.	CrO2	VR501 (L/R)		0 dBv	If the L and R levels are not uniform, adjust them to an average value of 0 dB.
10.		Record the 10 kHz/315 Hz, –20 dBv signal on STD–610 and play back.	METAL	VR502 (L/R)		0 dBv	
11.	Check distortion value after adjustment is completed and confirm that there is no underbias.						
12.	Turn OFF the DOLBY HX PRO switch.						
13.	REC →PLAY	Record and play back the 315 Hz signal and a 10kHz signal at –20 dBv input level.	NOR	VR553 (L)	LINE OUT	Turn the control fully counterclockwise, and gradually turn to the right to adjust to 0 dB ± 0.5 dB compared when HX–Pro is ON.	Turn control clockwise past the peak to assure proper overbias value.
				VR554 (R)			

7. RÉGLAGES

SECTION DE LECTURE

Réglage du niveau de lecture

- Ce réglage détermine le niveau DOLBY NR et il doit être effectué très soigneusement.

No.	Mode	Signal d'entrée et bande d'essai	Points de réglage		Points de mesure	Valeur de réglage	Remarques
1.	PLAY	Reproduire la section 315 Hz/0 dB de la bande d'essai STD–331B.	Deck	VR105 (can. G) VR106 (can. D)	TP. 3 (can. G) TP. 4 (can. D)	–15,0 dBv	This adjustment must be performed accurately for proper Dolby level setting.
2.			DOLBY S	VR2101 (can. G) VR2201 (can. D)	TP. 33S (can. G) TP. 34S (can. D)	–11,7 dBv	

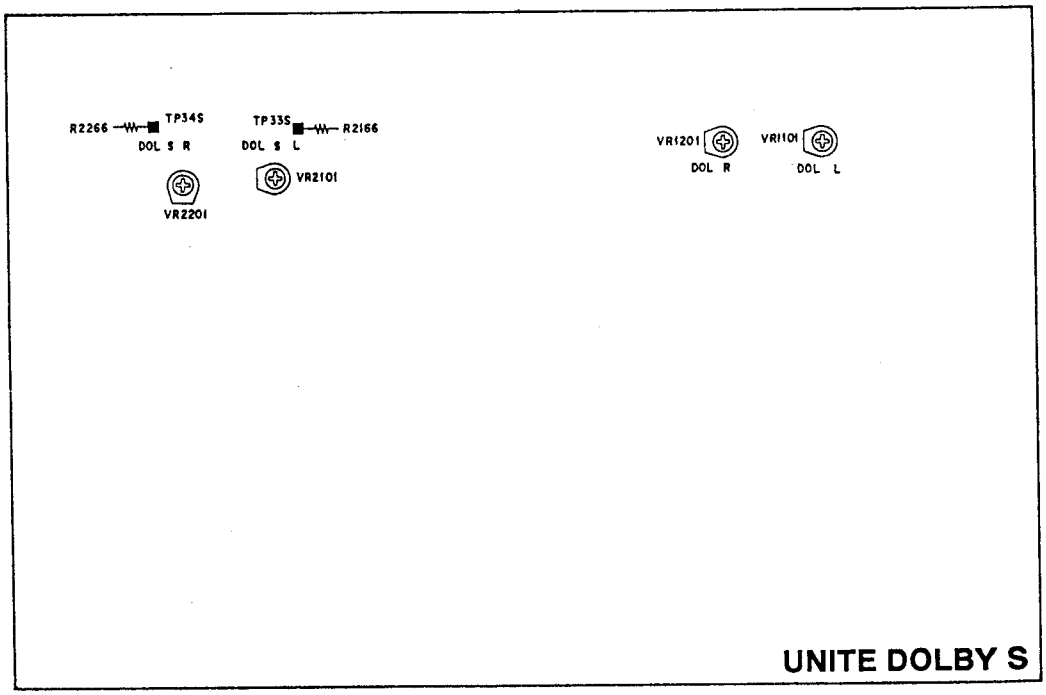


Fig. 7–1 Points de réglage

SECTION D'ENREGISTREMENT

Réglage du circuit réjecteur de polarisation

No.	Mode	Signal d'entrée et bande d'essai	Points de réglage		Points de mesure	Valeur de réglage	Remarques
1.	REC	Charger la bande d'essai STD–610 et n'introduire aucun signal.	Platine	L103 (can. G) L104 (can. D)	TP. 3 (can. G) TP. 4 (can. D)	Sortie minimum	
2.	Régler le commutateur Dolby NR sur la position S.						
3.	REC	Charger la bande d'essai STD–610 et n'introduire aucun signal.	DOLBY S	L2161 (can. G) L2261 (can. D)	LINE OUT	Sortie minimum	

Réglage du codeur DOLBY S

- Le réglage du codeur DOLBY S doit être effectué avant le réglage de la polarisation d'enregistrement.

No.	Mode	Signal d'entrée et bande d'essai	Points de réglage	Points de mesure	Valeur de réglage	Remarques
1.	Régler le commutateur DOLBY NR sur la position OFF.					
2.	REC/ PAUSE	Appliquer un signal de 315 Hz/–10 dBv aux bornes d'entrée de ligne.	Volume de lcommande de niveau REC	TP. 1 (can. G) TP. 2 (can. D)	–15,2 dBv	
3.	Régler le commutateur DOLBY NR sur la position S.					
4.	REC/ PAUSE	Appliquer le signal 315 Hz/ –10 dBv aux bornes d'entrée de ligne.	VR1101 (can. G) VR1201 (can. D)	TP. 1 (can. G) TP. 2 (can. D)	–14,5 dBv	

Réglage de la polarisation d'enregistrement

- Mettre l'interrupteur DOLBY HX PRO en circuit sur le panneau avant et régler la commande de polarisation BIAS sur la position centrale.

No.	Mode	Signal d'entrée et bande d'essai	Points de réglage		Points de mesure	Valeur de réglage	Remarques
1.	REC/ PAUSE	Appliquer un signal de 315 Hz/–20 dBv (lecture du décibelmètre –20) aux terminaux d'entrée de ligne et insérer STD–630.					
2.	REC →PLAY	Enregistrer et reproduire un signal de 315 Hz et un signal de 10 kHz à un niveau d'entrée de –20 dBv.	NOR	VR551 (G)	LINE OUT	Enregistrer et reproduire continuellement, comparant les niveaux de lecture de 315 Hz et 10 kHz et régler à 0,5 dBv ± 0,5 dB.	
				VR552 (D)			
3.		Enregistrer le signal de 10 kHz/315 Hz/–20 dBv sur STD–620 et reproduire.	CrO2	VR501 (G/D)		0 dBv ± 1,0 dB	
4.		Enregistrer le signal 10 kHz/315 Hz/–20 dBv sur STD–610 et reproduire.	METAL	VR502 (G/D)		0 dBv ± 1,0 dB	
5.	Vérifier la valeur de distorsion après avoir trminé le réglage et confirmer qu'il n'y a pas de sous polarisation.						
6.	Régler le commutateur Dolby NR sur la position S.						
7.	REC/ PAUSE	Appliquer un signal de 315 Hz/–20 dBv (lecture du décibelmètre –20) aux terminaux d'entrée de ligne et insérer STD–630.			LINE OUT		
8.	REC →PLAY	Enregistrer et reproduire un signal de 315 Hz et un signal de 10 kHz à un niveau d'entrée de –20 dBv.	NOR	VR551 (G)		Enregistrer et reproduire continuellement, comparant les niveaux de lecture de 315 Hz et 10 kHz et régler à 1,5 dBv ± 1,0 dB.	
				VR552 (D)			
9.		Enregistrer le signal de 10 kHz/315 Hz/–20 dBv sur STD–620 et reproduire.	CrO2	VR501 (G/D)		0 dBv	Si les niveaux gauche (L) et droit (R) ne sont pas uniformes, les régler sur une valeur moyenne de 0 dB.
10.		Enregistrer le signal 10 kHz/315 Hz/–20 dBv sur STD–610 et reproduire.	METAL	VR502 (G/D)		0 dBv	
11.	Vérifier la valeur de distorsion après avoir trminé le réglage et confirmer qu'il n'y a pas de sous polarisation.						
12.	Mettre l'interrupteur DOLBY HX PRO hors circuit.						
13.	REC →PLAY	Enregistrer et reproduire un signal de 315 Hz et un signal de 10 kHz à un niveau d'entée de –20 dBv.	NOR	VR553 (G)	LINE OUT	Tourner la commande à fond dans le sens contraire des aiguilles d'une montre, Puis la tourner graduellement vers la droite pour ajuster à 0 dB ± 0,5 dB comparé quand HX–Pro est en circuit.	Tournerla commande à droite au–delà de la crête pour assurer la valeur overbias correcte.
				VR554 (D)			

7. AJUSTES

SECCIONES DE REPRODUCCIÓN

Ajuste del nivel de reproducción

- Este ajuste determina el nivel DOLBY NR y debe realizarse con mucho cuidado.

N.º	Modo	Señal de entrada y cinta de prueba	Punto de ajuste		Punto de medición	Valor de ajuste	Comentarios
1.	PLAY	Produzca la parte de 315 Hz /0 dB de la cinta de prueba STD–331B.	Deck	VR105 (Lch) VR106 (Rch)	TP. 3 (Lch) TP. 4 (Rch)	–15,0 dBv	This adjustment must be performed accurately for proper Dolby level setting.
2.			DOLBY S	VR2101 (Lch) VR2201 (Rch)	TP. 33S (Lch) TP. 34S (Rch)	–11,7 dBv	

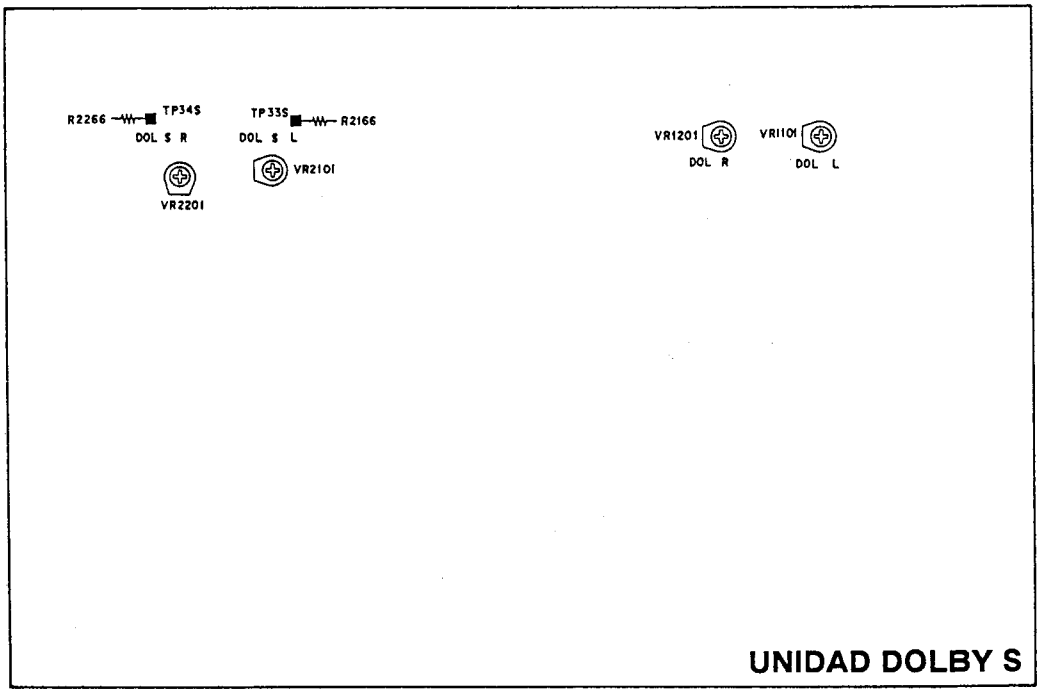


Figura. 7–1 Puntos de ajuste

SECCIONES DE GRABACIÓN

Adjuste del eliminador de polarización

N.º	Modo	Señal de entrada y cinta de prueba	Punto de ajuste		Punto de medición	Valor de ajuste	Comentarios
1.	REC	Introduzca la cinta de prueba STD–610 sin señal de entrada.	Platina	L103 (Lch) L104 (Rch)	TP. 3 (Lch) TP. 4 (Rch)	Salida mínima	
2.	Coloque el conmutador Dolby NR en S.						
3.	REC	Introduzca la cinta de prueba STD–610 sin señal de entrada.	DOLBY S	L2161 (Lch) L2261(Rch)	LINE OUT	Salida mínima	

Ajuste del codificador de DOLBY S

- El ajuste del codificador de DOLBY S debe efectuarse antes del ajuste de polarización de grabación.

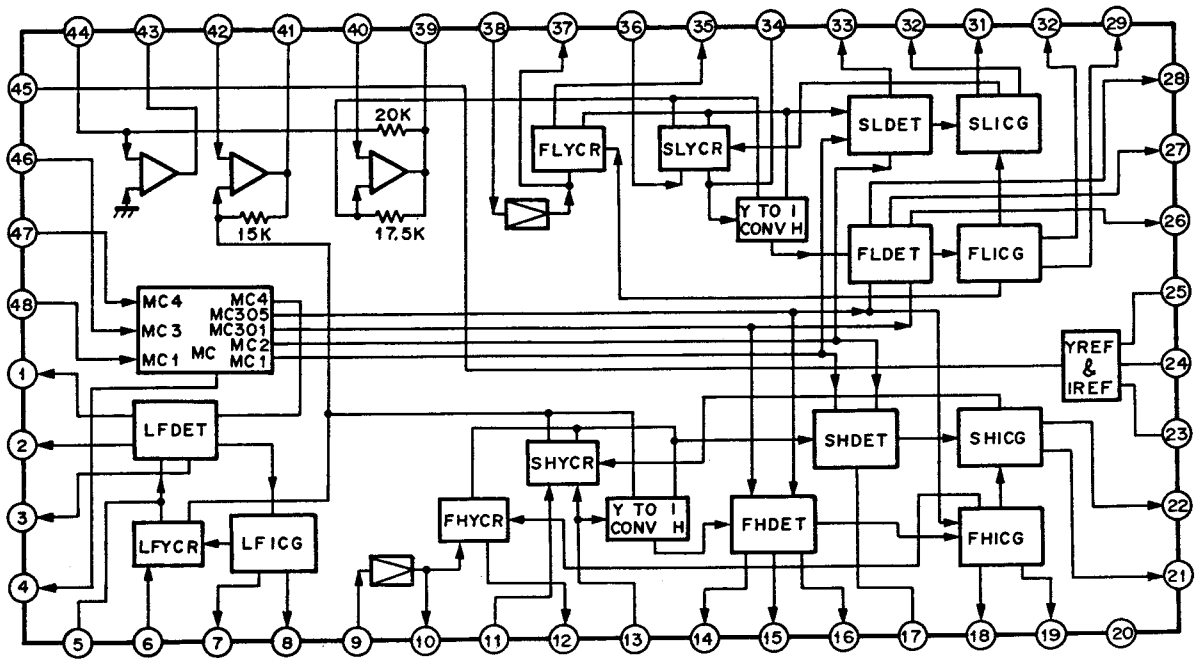
N.º	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Comentarios
1.	Desconecte el conmutador DOLBY NR.					
2.	REC/ PAUSE	Aplique una señal de 315 Hz/–10 dBv a los terminales de entrada de línea.	Volumen de control del nivel de grabación	TP. 1 (Lch) TP. 2 (Rch)	–15,2 dBv	
3.	Ponga el conmutador DOLBY NR en la posición S.					
4.	REC/ PAUSE	Aplique una señal de 315 Hz/–10 dBv a los terminales de entrada de línea.	VR1101 (Lch) VR1201 (Rch)	TP. 1 (Lch) TP. 2 (Rch)	–14,5 dBv	

Ajuste de la polarización de grabación

- Conecte el interruptor DOLBY HX PRO del panel delantero y coloque el control BIAS en la posición central.

N.º	Modo	Señal de entrada y cinta de prueba	Punto de ajuste		Punto de medición	Valor de ajuste	Comentarios
1.	REC/ PAUSE	Aplique una señal de 315 Hz/–20 dBv (dando una lectura de –20 UV en el medidor de volumen) a los terminales de entrada de línea, e inserte el casete STD–630.					
2.	REC →PLAY	Grabe y reproduzca la señal de 315 Hz y una señal de 10 kHz a un nivel de entrada de –20 dBv.	NOR	VR551 (L)	LINE OUT	Grabe y reproduzca repetidamente, comparando los niveles de reproducción 315 Hz y 10 kHz, y ajuste a 0,5 dBv ± 0,5 dB.	
				VR552 (R)			
3.		Grabe la señal de 10 kHz /315 Hz –20 dBv en la cina STD–620, y reprodúzcala.	CrO2	VR501 (L/R)		0 dBv ± 1,0 dB	
4.		Grabe la señal de 10 kHz /315 Hz, –20 dBv en la cinta STD–610, y reprodúzcala.	METAL	VR502 (L/R)		0 dBv ± 1,0 dB	
5.	Verifique el valor de la distorsión una vez finalizado el ajuste y confirm e que no haya subpolarización.						
6.	Coloque el conmutador Dolby NR en S.						
7.	REC/ PAUSE	Aplique una señal de 315 Hz/–20 dBv (dando una lectura de –20 UV en el medidor de volumen) a los terminales de entrada de línea, e inserte el casete STD–630.					
8.	REC →PLAY	Grabe y reproduzca la señal de 315 Hz y una señal de 10 kHz a un nivel de entrada de –20 dBv.	NOR	VR551 (L)	LINE OUT	Grabe y reproduzca repetidamente, comparando los niveles de reproducción 315 Hz y 10 kHz, y ajuste a 1,5 dBv ± 1,0 dB.	
				VR552 (R)			
9.		Grabe la señal de 10 kHz /315 Hz –20 dBv en la cina STD–620, y reprodúzcala.	CrO2	VR501 (L/R)		0 dBv	Si los niveles izquierdo y derecho no son uniformes, ajustelos a un valor medio de 0 dB.
10.		Grabe la señal de 10 kHz /315 Hz, –20 dBv en la cinta STD–610, y reprodúzcala.	METAL	VR502 (L/R)		0 dBv	
11.	Verifique el valor de la distorsión una vez finalizado el ajuste y confirm e que no haya subpolarización.						
12.	Desconecte el interruptor DOLBY HX PRO.						
13.	REC →PLAY	Grabe y reproduzca la señal de 315 Hz y una señal de 10 kHz a un nivel de entrada de –20 dBv.	NOR	VR553 (L)	LINE OUT	Gire el control completamente hacia la izquierda y luego gírelo gradualmente a la derecha para ajustar a 0 dB ± 0,5 dB cuando HX–PRO está conectado.	Gire el control en sentido horario hasta pasar el pico para asegurar un correcto valor de sobrepolarización.
				VR554 (R)			

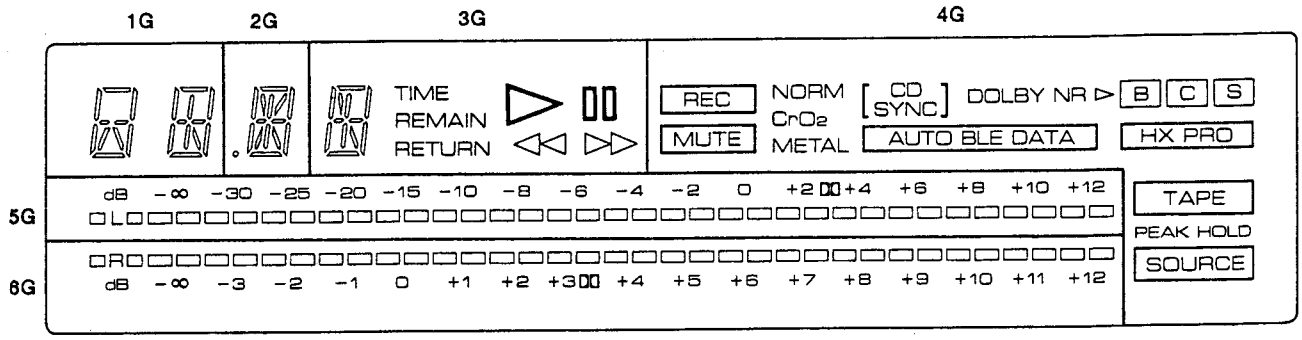
8. IC INFORMATION (CXA1417S)

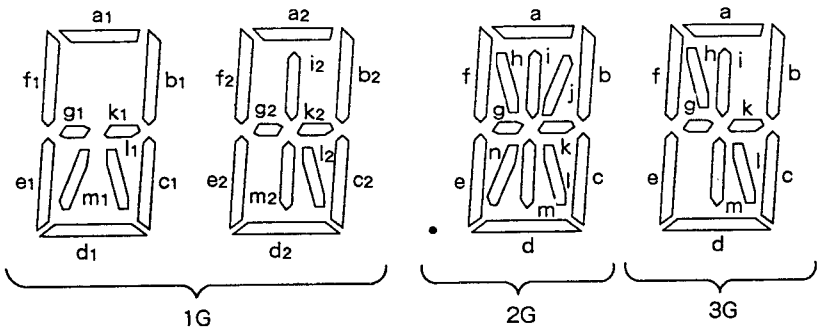


Pin Description

Pin No.	Symbol	Description
1	ZL1	Weighting pin of the HL/LF/FB main band rectifier
2	ZL2	Input pin of the HL/LF/FB pass band rectifier
3	ZL3	Weighting pin of the HL/LF/FB pass band rectifier
4	MCTC	Time constant pin of the MC2
5	LFO	Input pin of the HL/LF/FB main band rectifier
6	LFIN	Input pin of the HF/LF/FB stage
7	TCL1	Primary time constant pin of the HL/LF/FB detector
8	TCL2	2ndary time constant pin of the HL/LF/FB detector
9	SCINH	Input pin of the HL/HF side chain
10	SCBOH	Output pin of the HL/HF side chain buffer amplifier
11	SBINH	Input pin of the HL/HF/SB VCR
12	FBO1H	Output pin of the HL/HF/FB VCR
13	FBO2H	Input pin of the HL/HF/FB V to I converter
14	ZHF1H	Weighting pin of the HL/HF/FB main band rectifier
15	ZHF2H	Input pin of the HL/HF/FB pass band rectifier
16	ZHF3H	Weighting pin of the HL/HF/FB pass band rectifier
17	ZHSH	Weighting pin of the HL/HF/SB rectifier
18	TCF1H	Primary time constant pin of the HL/HF/FB detector

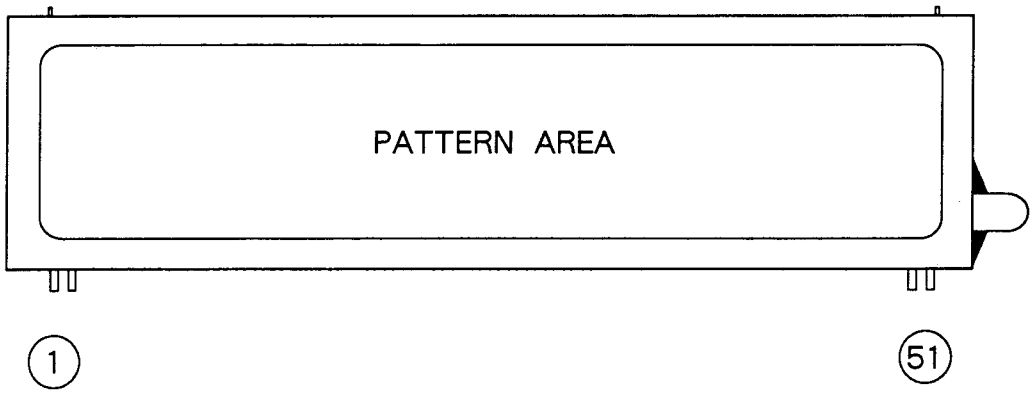
Pin No.	Symbol	Description
19	TCF2H	2ndary time constant pin of the HL/HF/FB detector
20	VRX	Voltage source pin inversely proportional to shift of the internal R
21	TCS2H	2ndary time constant pin of the HL/HF/SB detector
22	TCS1H	Primary time constant pin of the HL/HF/SB detector
23	GND	For split supply GND pin. For single supply voltage source pin of Vcc/2
24	VEE	For split supply VEE pin. For single supply GND pin
25	VCC	Vcc pin
26	ZHF1L	Weighting pin of the LL/HF/FB main band rectifier
27	ZHF2L	Input pin of the LL/HF/FB pass band rectifier
28	ZHF3L	Weighting pin of the LL/HF/FB pass band rectifier
29	TCF2L	2ndary time constant pin of the LL/HF/FB detector
30	TCF1L	Primary time constant of the LL/HF/FB detector
31	TCS2L	2ndary time constant pin of the LL/HF/SB detector
32	TCS1L	Primary time constant pin of the LL/HF/SB detector
33	ZHSL	Weighting pin of the LL/HF/SB rectifier
34	FBO2L	Input pin of the LL/HF/FB V to I converter
35	FBO1L	Output pin of the LL/HF/FB VCR
36	SBINL	Input pin of the LL/HF/SB VCR
37	SCBOL	Output pin of the LL/HF side chain buffer amplifier
38	SCINL	Input pin of the LL/HF side chain
39	RECOUT	Recording (Encode) output pin
40	LLSMP	Input pin of the LL stage main path
41	HLSOUT	HL stage output pin
42	HLSMP	Input pin of the HL stage main path
43	MCBO	MC buffer output pin
44	MCBFB	MC buffer feedback pin
45	IREF	Reference current input pin
46	MC3IN	MC3 input pin
47	MC4IN	MC4 input pin
48	MC1IN	MC1 input pin





ANODE CONNECTION

	6G	5G	4G	3G	2G	1G
S0	R0	L0	S	a	a	a_2
S1	R1	L1	C	b	b	b_2
S2	R2	L2	B	i+m	i	i_2+m_2
S3	R3	L3	HX PRO	h+l	h	f_2
S4	R4	L4	DOLBY NR ▶	k	j	g_2+k_2
S5	R5	L5	[CD SYNC]	f	f	c_2
S6	R6	L6	AUTO BLE DATA	g	g	l_2
S7	R7	L7	NORM	c	k	e_2
S8	R8	L8	CrO_2	e	c	d_2
S9	R9	L9	METAL	d	n	a_1
S10	R10	L10	REC	▮▮	l	b_1
S11	R11	L11	MUTE	▶	m	f_1
S12	R12	L12	TAPE	TIME	e	g_1+k_1
S13	R13	L13	HOLD	REMAIN	d	c_1
S14	R14	L14	PEAK	▶▶	●	l_1+n_1
S15	R15	L15	SOURCE	◀◀		e_1
S16	S16	S16		RETURN		d_1
ALL	ALL	ALL				



PIN CONNECTION

PIN No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
CONNECTION	AC2	AC2	NP	NP	1G	2G	3G	4G	5G	6G	P (ALL)	P (S0)	P (S1)	P (S2)	P (S3)	P (S4)	NP

PIN No.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
CONNECTION	P (S5)	P (S6)	P (S7)	NP	P (S8)	P (S9)	P (S10)	P (S11)	P (S12)	P (S13)	P (S14)	P (S15)	NP	NP	P (S16)	NP	NP

PIN No.	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
CONNECTION	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	AC1	AC1

Notes F: Filament
G: Grid
P: Anode
NP: No Pin

9.2 TECHNICAL DESCRIPTION OF DOLBY S TYPE NOISE REDUCTION

9.2.1 S Type Circuit Operation

Same as all other Dolby noise reduction system, the complementary system is employed for S type, too. It does encoding during recording and makes complimentary decoding during playback. The operation of the decoding is described below, but the encoder can select the decoding mode. This also applies to the A type, B type, and SR type.

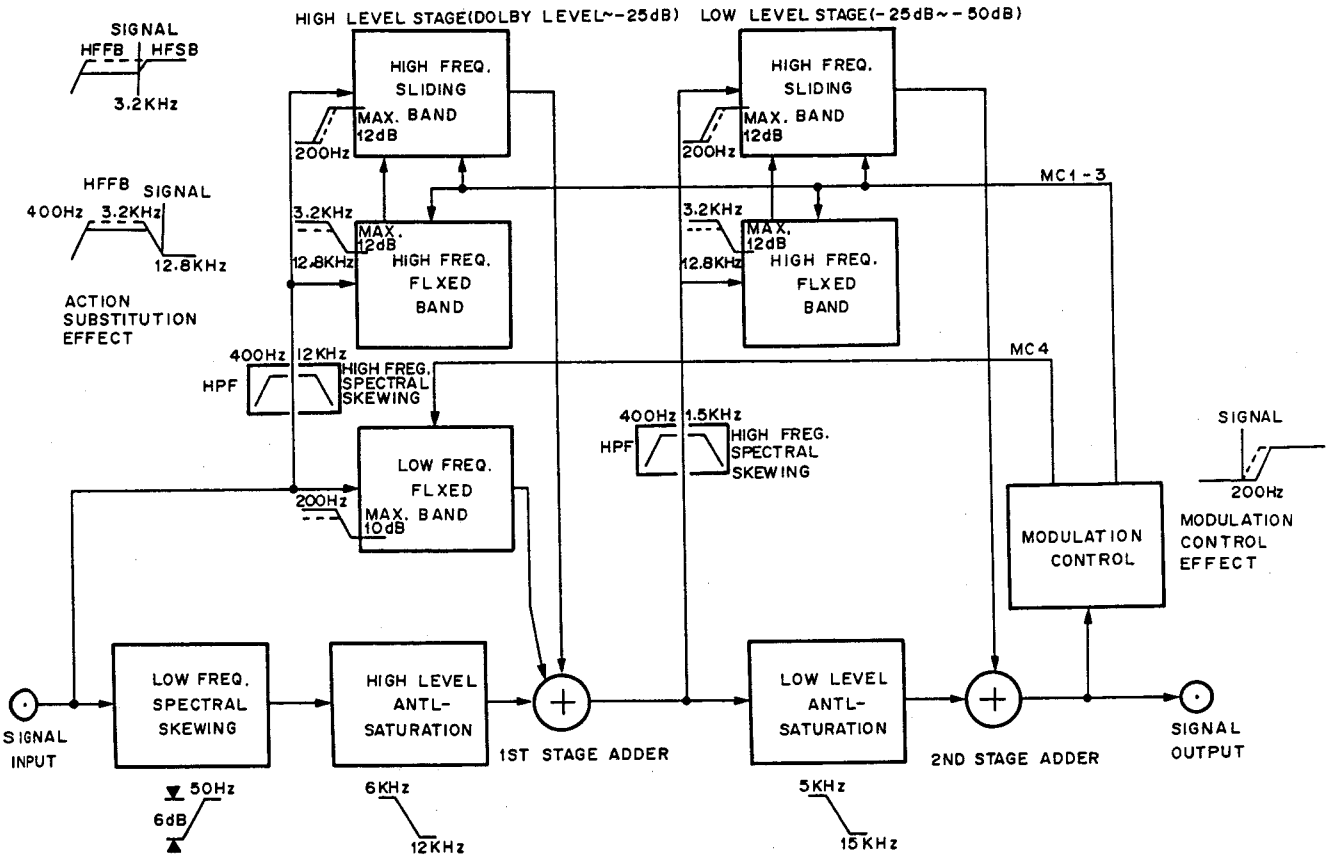


Fig. 1 S–type Encoder Block Diagram

The S type encoder has two stages of stagger-action circuit which operate against the different signal level area same as the C type. Each stage of the circuits consists of a linear main path (main circuit) and a side chain (sub circuit) for generating a dynamic component and adding it to the main path.
There are three compression circuits at the high level stage of the side chain, and these are referred to as the high-frequency fixed band (HF/FB), high-frequency sliding band (HF/SB), and low-frequency fixed band (LF/FB). At the low level stage, there are high-frequency fixed band and the high-frequency sliding band. The fixed band is band limited to maintain the compression level at frequencies below main signals above 6 kHz. Therefore, signal modulation effect by the encoder and general noise modulation can be suppressed.
The fixed band and the sliding band are used in a combination with the technique called "action substitution".

The encoder output is fed back to the control system of each compression circuit via a filter. It controls the compression operation based on the technique called "modulation control".

The spectral skewing circuit serves to lower the sensitivity of the circuits for the spectral skewing super low-frequency and super high-frequency signals. This circuit is placed in the input section of the encoder. On the other hand, the high-frequency attenuator suppresses an increase in the compression ratio at high frequencies with it split into two high-frequency spectral skewing circuits in the high level stage and the low-level stage. Two stages of anti-saturation circuit are designed to suppress high-frequencies for preventing the tape saturation.

The S type encoder serves to optimize the characteristics of an input signal for providing a maximum boost level at low and high frequencies outside the major signal band. The overshoot suppression circuit (O/S) is also designed to obtain the maximum boost level.

"Minimum treatment" is always maintained for the signal in this way, and its output is made stable with little or no level fluctuations. When the signal is decoded, the maximum noise reduction effects can be derived at the frequencies below the signal, and the resistance power for an characteristic error in the transmission system is held high. The maximum noise reduction level is 24 dB in high-frequencies and 10 dB in low-frequencies.

9. DOLBY S TYPE CIRCUIT DESCRIPTION

9.1 THEORY OF OPERATION OF DOLBY S TYPE RECORDING SYSTEM

9.1.1 Minimum Treatment

The complementary type noise reduction system boosts a low level signal during recording and reduces it together with noise added at the time of recording. To avoid tape saturation, the high level signal is not boosted. Also, in order to preclude the possibility of secondary effect such as noise modulation, in ideal noise reduction system, an operation that results in a certain gain is made, even though there is a high level signal outside the spectrum when there is no high level signal. This is referred to as the "minimum treatment" theory. In the Dolby S type, this theory is more extensively and thoroughly applied than that in home appliance systems.
As a result, there is little or no possibility of a high level signal giving adverse effects on a low level signal, and the system is relieved from the audible secondary effect. Also, it is possible to hold the effects of a decoding error caused by the use of a tape that is not properly adjusted to meet the specifications of a cassette recorder. In addition, no dynamic audible defect such as "pumping" occurs even if playback is made on the S type with or without decoding by the Dolby B type system.

9.1.2 Action Substitution

In a high band range where the cassette noise tends to increase, the Dolby S type is provided with a fixed band processing circuit and a sliding band processing circuit. (A fixed band only is used in a low-band range where noise tends to be considerably reduced.)
This combination makes it possible to realize action substitution which provides the merit of the operation of each circuit and minimizes demerits.

Action substitution means to imply the theory of minimum treatment by the noise reduction band itself. This holds a drop of recording compression to a minimum in the frequency band higher than the high level signal that is generated when a fixed band circuit only is used, or in a frequency band lower than the high level signal generated when a sliding band only is used. Therefore, the effect of a high level signal within the noise reduction band on the low level signal can be held to a minimum.

9.1.3 Modulation Control

While the action substitution holds the effects due to a medium high level signal within the noise reduction band, modulation control holds the effects of an extremely large high level signal outside the noise reduction band to a minimum. For example, in a state where no modulation control is made, high-frequency sliding band tends to go toward a high-frequency band, which causes a drop in the audible noise low band effect according to the level increase of middle-band signal. In the modulation control, the sliding band is prevented from being slid more than necessary by a high level signal beyond a certain fixed threshold level. It is the modulation control which stably compress a low level signal to a greater extent than as before as the theory of minimum treatment is closely observed.

9.1.4 Stagger-action

Noise reduction of 20 dB or more is obtained in the Dolby S type. An attempt to derive an NR level greater than that by the conventional method results in exposing a low level signal to excessively large compression ratio. For this reason, in the Dolby S type, compression is achieved by two stagger-action stages which differ in the signal level handled. In this way also, the compression ratio can be held to a relatively low value. This technique has been developed in the Dolby C type, and further improvement has been attained in the Dolby SR type.

9.1.5 Spectral Skewing and Anti-saturation

This technology had been developed in the Dolby C type, and has been improved further in the Dolby SR type. The spectral skewing serves to enhance the system resistance power against the frequency characteristic error in the frequency shaping network, and the anti-saturation serves to efficiently apply the load to the tape also in the frequency shaping network. The anti-saturation also serves to make the head room larger and to decrease the distortion. Unlike the Dolby C type, the Dolby S type can be employed not only in a high band range, but also in a low band range. This is effective for reducing the low band distortion caused by a large boost level of low band compensation during cassette recording.

[Major Differences between the Dolby S Type and the Dolby SR Type]

The cassette media largely differs from the 15/30 inch open reel tape recorder for professional uses. It differs from this type only in noise spectrum component, and a transfer in a low–speed cassette is extremely small. The listening level at ordinary homes is far lower than the monitor level at a studio. The Dolby S type can realize simpler and lower cost system as compared with the Dolby SR type by making its specifications meet these conditions.
The tape noise of a cassette is concentrated in high–frequencies, and the transfer is relatively small. To cover low–frequencies, one stage of a fixed band processing circuit in the Dolby S type suffices. In the Dolby SR type, on the other hand, the fixed and sliding bands form a 2–stage low band processing circuit.
In high–frequencies, the circuit of the Dolby SR type is of 3–stage design while the circuit of the Dolby S type is of 2–stage fixed and sliding band noise reduction circuit design. This substantially eliminates the slightest possibility of audible noise modulation at an extremely large listening level for professional use.

Therefore, the greatest difference of all lies in that the Dolby S type consists merely of five circuits while there are ten circuits of the noise reduction process element in the Dolby SR type.

- *Dolby noise reduction and HX Pro headroom extension manufactured under license from Dolby Laboratories Licensing Corporation. HX Pro originated by Bang & Olufsen.*
- *"DOLBY", the double-D symbol ◻◻ and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.*

9.2.2 High Level Stage

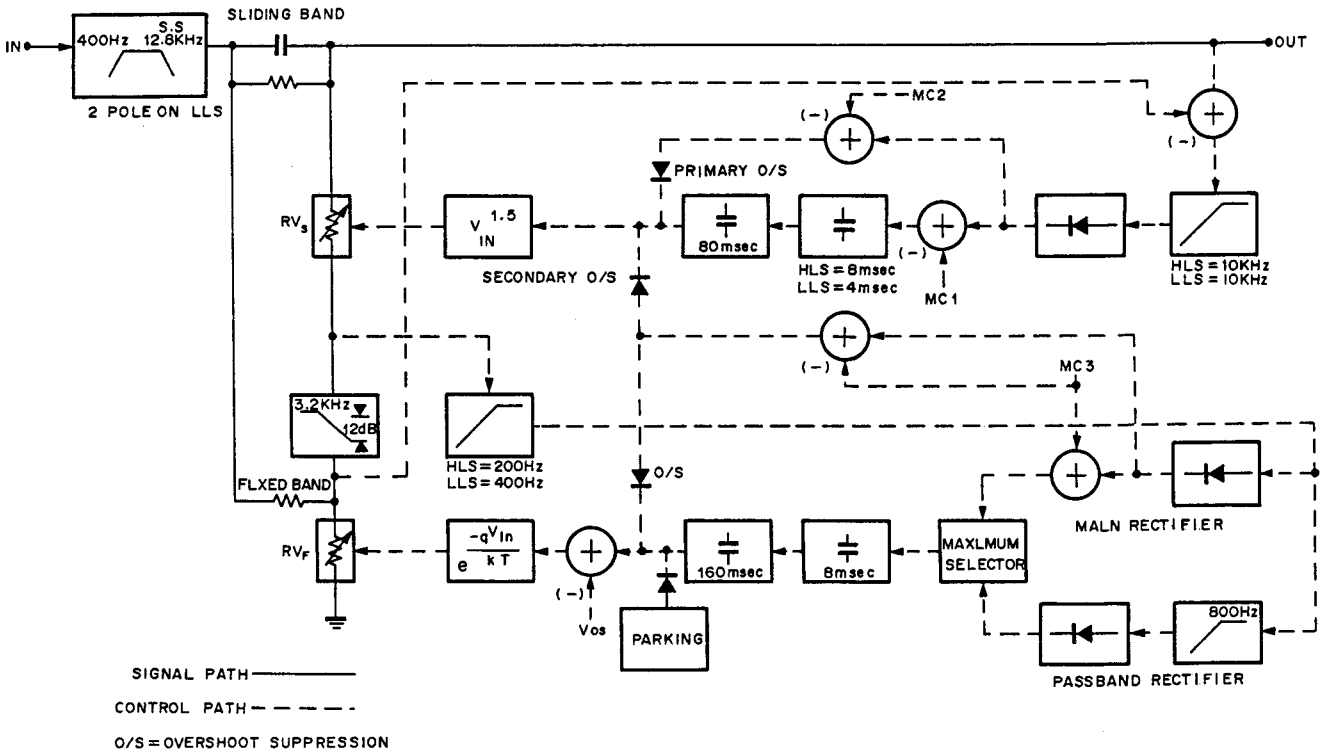


Fig. 2 S-type HF Stage Block Diagram

The high level stage operates at signal levels above -25 dB and boosts the signal up to 12 dB at frequencies above 400 Hz and up to 10 dB at frequencies below 200 Hz.

The low-frequency fixed band is a passive low-pass filter basically having a variable attenuator in the last stage. The attenuation level increases as the signal level goes up. The high-frequency fixed band is similar to the foregoing, but it consists of a high-pass filter and a variable attenuator circuit. The high-frequency sliding band is a variable frequency high-pass filter so that the cutoff frequency increases with a rise in the signal level and the frequency. (The same as the B and C type NR processors.) An input to the sliding band is designed in such a way that a difference between the high-frequency fixed and the input signal plus a fixed band output (operation replaced) is output.

The control signal is derived from the compression circuit and rectified and smoothened after filtration to obtain a signal of stable average level. There is another route provided in addition to it. This route applies voltage quickly to the control system in such a way that the overshoot can be suppressed under the transient high level state. The modulation control signal controls the attenuation level under the condition in which no attenuation beyond that is required by attenuating the control signal from the control system. This final signal is supplied to the nonlinear control law stage to derive control voltage characteristics for the required attenuation level.

9.2.3 Low Level Stage

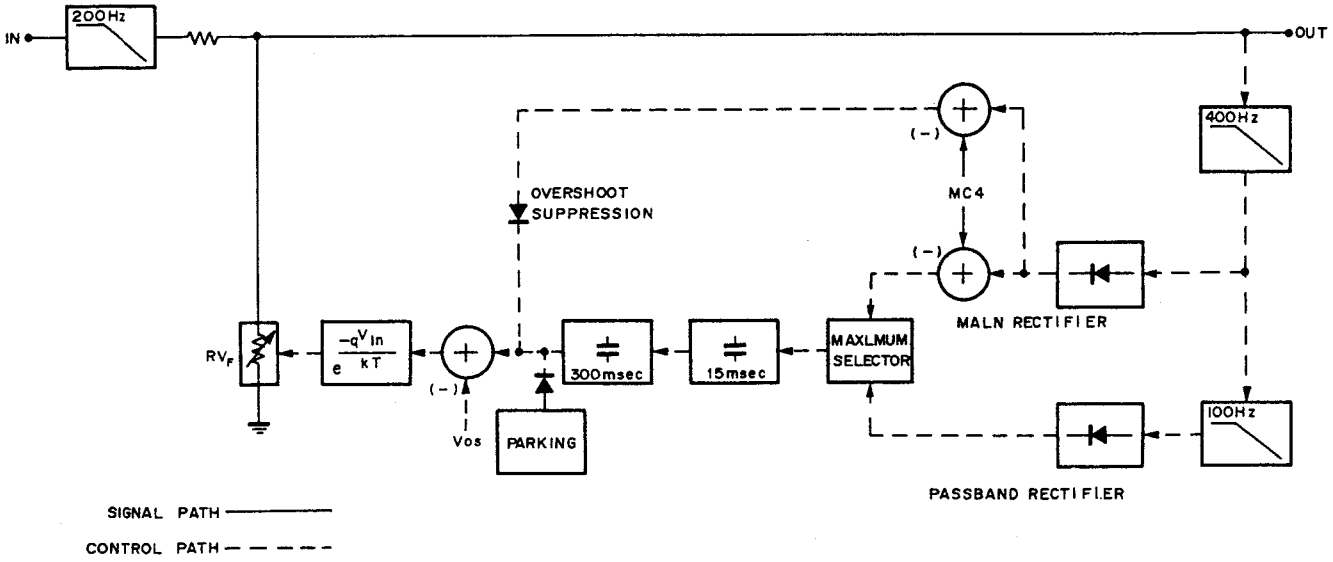


Fig. 3 S-type LF Stage Block Diagram

The low level stage operates in the range of -50 to -25dB signal level. While it does not process low-frequency signals, it performs operation similar to the high level stage except for above point.

9.2.4 Modulation Control

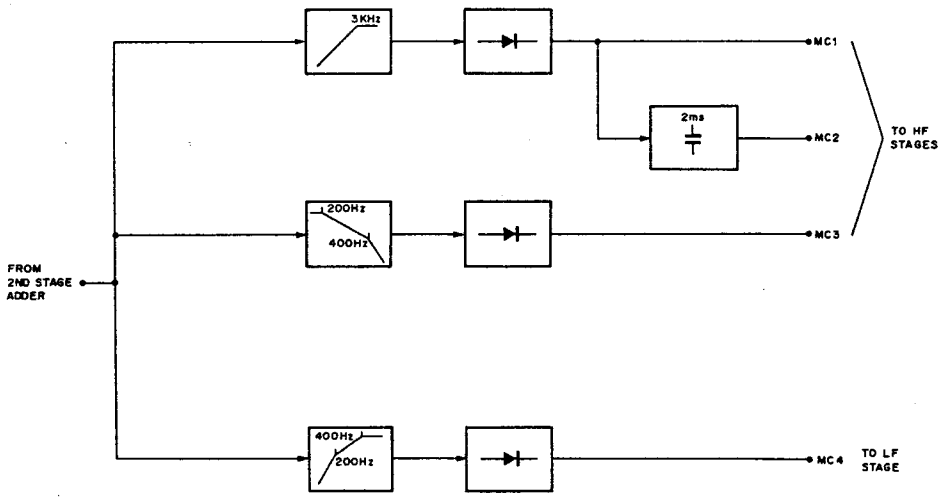


Fig. 4 S-type Modulation Control Circuits Block Diagram

The modulation control circuit is additionally mounted in to prevent the compression circuits to make no unnecessary modulation against the high-level signal input. An encoder output is sent to the input end of the modulation control circuit to divide it into three frequency bands. The MC1 signal is full-wave rectified after passing through the 3-kHz high-pass filter and then supplied in spite of the high-frequency sliding band. The MC2 signal is derived by smoothening the MC1 signal using a 2-sec time constant, and then supplied in spite of the presence of a high-frequency sliding band overshoot suppression circuit. MC3 is passed through a low-pass filter with 200 and 400 Hz as corner frequencies, full-wave rectified, and then supplied in spite of the presence of high-frequency fixed band. The low-frequency fixed band is designed to be controlled by MC4. It is full-wave rectified via 200 Hz and 400 Hz high-pass filters.

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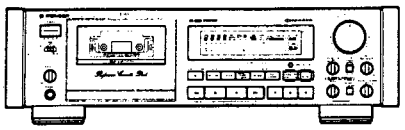
Service Manual



ORDER NO.
ARP2216

STEREO CASSETTE DECK

CT-979

CT-979 HAS THE FOLLOWING:

Type	Power Requirement	Remarks
HEM	AC220V–230V, 230V–240V (switchable) *	
HB	AC220V–230V, 230V–240V (switchable) *	

*Change the primary wiring of the power transformer.

- **This manual is applicable to the HEM and HB types.**
- **Ce manuel pour le service comprend les explications de réglage en français.**
- **Este manual de servicio trata del método ajuste escrito en español.**

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PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
PIONEER ELECTRONICS OF CANADA, INC. 505 Cochrane Drive, Markham, Ontario L3R 8E3 Canada
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 9120 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911

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SI APR. 1991 Printed in Japan

1. EXPLODED VIEWS AND PARTS LIST

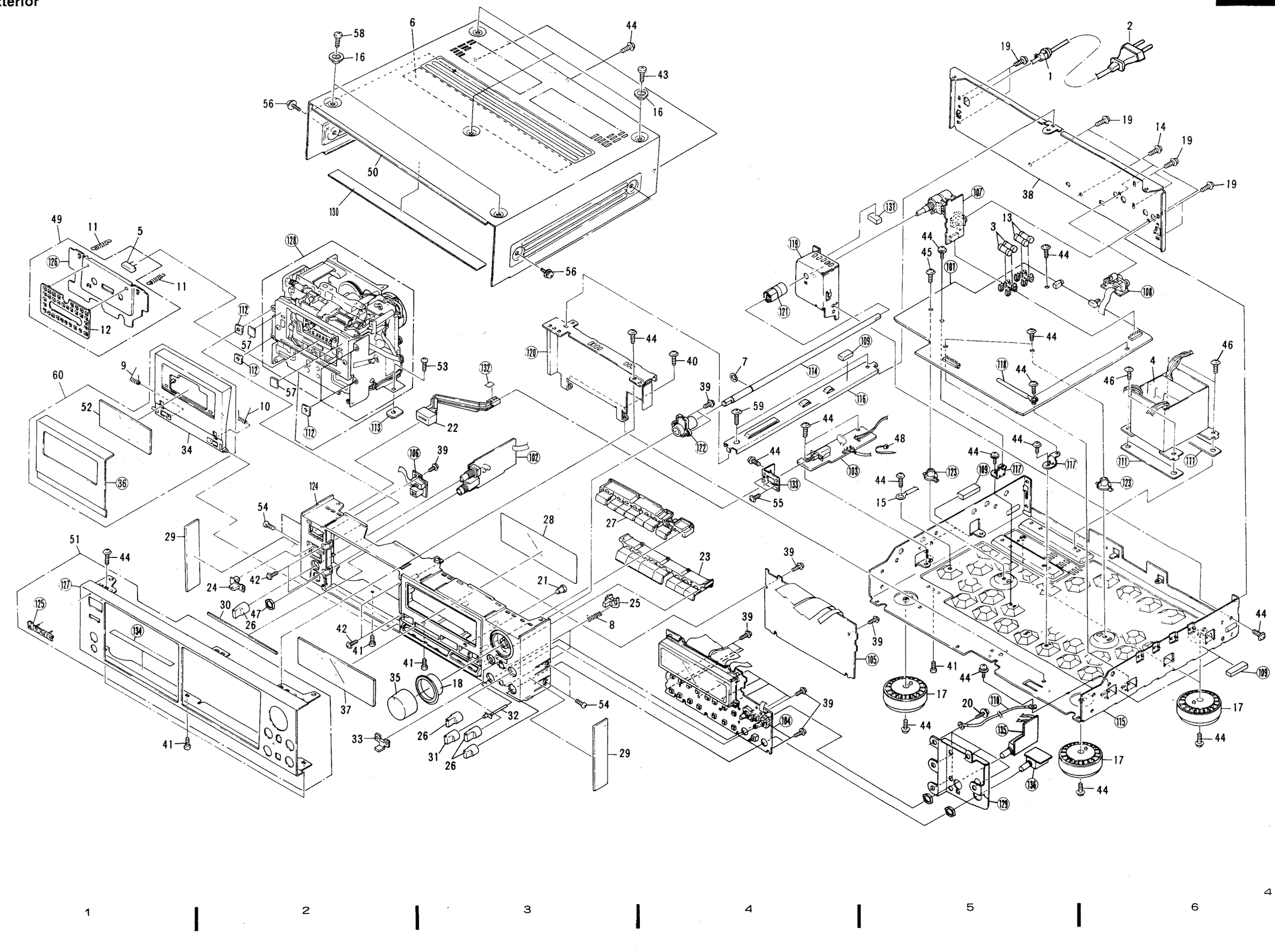
NOTES:

- Parts without part number cannot be supplied.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

1.1 PARTS LIST OF EXTERIOR

Mark	No.	Description	Part No.
	1	Cord stopper	CM – 22B
⚠	2	AC power cord (For HEM type)	ADG1036
⚠		AC power cord (For HB type)	PDG1036
⚠	3	FU703, FU704 Fuse (T2A)	REK – 103
⚠	4	Power transformer (T1)	RTT1158
	5	LED (D3)	SLF – 401C
	6	Absorber plate (B)	PNB1109
	7	Washer	RBF1019
	8	Button spring	RBH1144
	9	Door spring (L)	RBH1222
	10	Door spring (R)	RBH1223
	11	Cassette plate spring	RBL – 059
	12	Stabilizer (B)	REB1038
⚠	13	FU701, FU702 Audio fuse (T630mA)	REK – 098
	14	Screw	BBZ30P100FCC
	15	Cord clamper	
	16	Washer	ABE1009
	17	Leg assembly	AMR1159
	18	VR ring	RAT1007
	19	Screw	BBZ30P060FCC
	20	Screw	BBZ26P100FMC
	21	Counter reset knob	RAA1009
	22	Power button	RAC1410
	23	Function knob	RAC1411
	24	Slide SW knob	RAC1562
	25	Push knob	RAC1413
	26	Knob (B)	RAC1414
	27	Mode knob	RAC1609
	28	FL filter	RAH1542
	29	Side rubber	REB1094
	30	Door sheet	REB1119
	31	Knob (ABS)	RAC1608
	32	BIAS lens	RNK1674
	33	Line straight lens	RNK1682
	34	Door	RNK1495
	35	VR knob assembly (A)	RXA1281
	36	Door panel	
	37	FL lens	RLP1027
	38	Rear panel	
	39	Screw	ABZ26P080FZK
	40	Screw	BBT30P060FCC
	41	Screw	BBT30P100FZK
	42	Screw	BBZ30P100FZK
	43	Screw (FE)	RBA1090
	44	Screw	IBZ30P060FCC
	45	Screw	IBZ30P100FCC
	46	Screw	IBZ40P080FCC
	47	Jack nut	RBN – 006
	48	Binder	REC – 371
	49	Cassette plate assembly	RXX1064
	50	Bonnet	RXX1279
	51	Front panel assembly	RXX1382
	52	Door lens	RLP1026
	53	Screw	BBT30P080FCU
	54	Screw	BBZ30P080FZK
	55	Screw	PMA30P060FCU
	56	Screw (FE)	RBA1088
	57	Door cushion	REB1117
	58	Screw (FE)	RBA1089
	59	Nylon rivet	RBM – 003
	60	Door assembly	RXX1416
	101	Main unit	
	102	Headphone unit	
	103	Power switch unit	
	104	Operation unit	
	105	Control unit	
	106	Timer switch unit	
	107	Input VR unit	
	108	Pin jack unit	
	109	Rubber spacer (A)	
	110	Wire	
	111	Transformer sheet	
	112	Mechanism sheet	
	113	Mechanism sheet (2)	
	114	VR shaft	
	115	Main chassis	
	116	Center stay	
	117	P.C.B base	
	118	Binder	
	119	VR holder	
	120	FL shield plate	
	121	Joint	
	122	VR shaft guide	
	123	P.C.B stad	
	124	Panel stay	RNT1108
	125	Name plate	
	126	Cassette plate	
	127	Front panel	
	128	Mechanism unit	
	129	Motor bracket (FE)	
	130	Protector 300 × 10	RED1020
	131	Cushion	
	132	Acetate tape 10 × 10	
	133	PS holder	
	134	Acetate tape (K)	
	135	Motor VR unit	
	136	HX SW unit	

Exterior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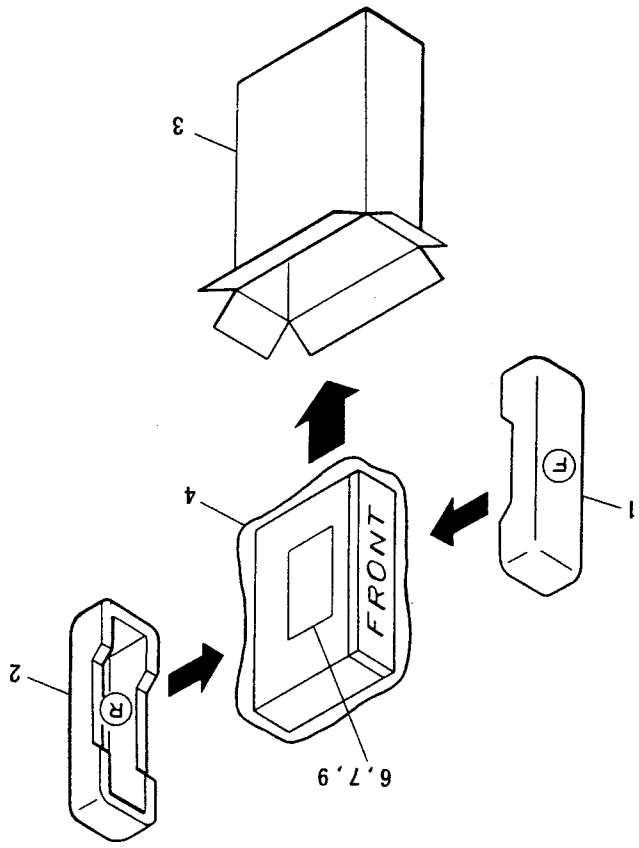
1.2 PARTS LIST OF MECHANISM SECTION

Mark	No.	Description	Part No.
	1	Rotary encoder	RSX1004
	2	Capstan motor assembly	RXM1016
	3	Reel motor assembly	RXM1018
	4	Step screw	RBA1074
	5	Thrust spring	RBL – 044
	6	Insulator	REB1099
	7	Pinch spring	RBL – 028
	8	Pinch thrust spring	RBL – 030
	9	Sub – pinch spring	RBL – 098
	10	Capstan belt	REB – 501
	11	Capstan belt (A)	REB – 509
	12	Tape guide	RNL – 016
	13	Flywheel assembly	RXA1374
	14	Sub – flywheel assembly	RXA1375
	15	Metal holder assembly(A)	RXA1342
	16	Metal holder assembly(B)	RXA1343
	17	Pinch roller arm (R) assembly	RXB – 876
	18	Pinch roller arm (A) assembly	RXB – 877
	19	BT spring (C)	RBH1213
	20	BT spring (B)	RBL – 032
	21	Idler pressure spring	RBL – 033
	22	Reel shaft cap (B)	RNK – 815
	23	BT disk assembly	RXB – 751
	24	Reel base assembly	RXB – 874
	25	Take – up idler assembly	RXB – 875
	26	Washer	RBF – 065
	27	Head base spring	RBL – 037
	28	Brake spring	RBL – 038
	29	Drive belt	REB1169
	30	Brake shoe	REB – 511
	31	Brake	RNL – 723
	32	Cam gear	RNK1640
	33	Side cam gear assembly	RXA1349
	34	Pocket spring (A)	RBL – 027
	35	Eject spring	RBL – 039
	36	Half set arm spring	RBL – 040
	37	REC functioning spring	RBL – 041
	38	Detection functioning spring	RBL – 042
	39	·····	
	40	O ring	REB – 447
	41	Cord clamper	RNH – 184
	42	Cassette plate	RNK1498
	43	REC detector arm	RNL – 733
	44	Chrom detector arm	RNL – 734
	45	Metal detector arm	RNL – 735
	46	Piston	RNL – 739
	47	Cylinder	RNL – 740
	48	·····	
	49	Collar	RNL – 742
	50	Pocket (L)	RNL – 849
	51	Pocket (R)	RNL – 850
	52	Washer	RBF – 057
	53	Screw	BBZ26P080FZK
	54	·····	
	55	Screw	BBZ30P080FZK

Mark	No.	Description	Part No.
	56	·····	
	57	Screw	BCZ30P060FMC
	58	Screw	BMZ26P030FZK
	59	Screw	BMZ26P040FMC
	60	Screw	BMZ26P060FZK
	61	Screw	BMZ30P080FZK
	62	Screw	JGZ20P025FMC
	63	Screw	PMA26P050FZK
	64	Screw	PMA26P060FZK
	65	Screw	PMZ20P080FZK
	66	Washer	RBF – 030
	67	Thrust washer (A)	RBF – 069
	68	Thrust washer (B)	RBF – 070
	69	Washer	RBF – 076
	70	Washer	RBF1040
	71	Binder	REC – 371
	72	Steel ball (3mm)	REF – 022
	73	Steel ball (4mm)	REF – 023
	74	Screw	VCT30P060FZK
	75	Screw	VCZ26P080FMC
	76	Washer	WA21D040D013
	77	Washer	WA26N070W040
	78	Washer	WA32D080D050
	79	E ring	YE20FUC
	80	E ring	YE25FUC
	81	E ring	YE30FUC
	82	Snapring	YS24FBT
	83	Power motor assembly	RXX1055
	84	Head base assembly	RXX1342
	85	Mechanism chassis assembly	RXA1366
	86	Brake lever	RNK1638
	87	Second pulley assembly	RXA1350
	88	Gear base assembly	RXA1351
	89	Pinch lever assembly	RXA1360
	90	Pocket felt	RED1028
	101	E head	
	102	R & P head	
	103	Connector unit	PWM1223
	104	Power motor	
	105	Insulator spring	RBH1226
	106	Reel motor mounting plate	RNE1169
	107	Flywheel holder	RNH – 304
	108	Motor bracket	RNK1497
	109	Thrust holder	RNL – 743
	110	Motor pulley	
	111	Pressure arm (R)	RNL – 725
	112	Pressure arm (L)	RNL – 726
	113	Adjustment nut	
	114	Head base set spring	RBL – 026
	115	Head adjustment spring (C)	
	116	Hight spring	
	117	Head base	
	118	Sub – head base	
	119	E head base	
	120	·····	

Mark	No.	Description	Part No.
	121	First pulley	
	122	Gear chassis assembly	RXA1171
	123	Pinch base assembly	RXB – 878
	124	·····	
	125	·····	
	126	·····	
	127	Cassette plate spring	RBH1227
	128	Position spring	RBL – 045
	129	Plate rubber (A)	REB1100
	130	Plate rubber (B)	REB1101
	131	Door arm	RNE1324
	132	Pocket frame	RNE1327
	133	Eject lever	RNL – 738
	134	Shift shaft assembly	RXB – 885
	135	Door frame (R) assembly	
	136	Door frame (L) assembly	RXA1285
	137	Earth lead assembly	
	138	REC switch unit	
	139	Tape selector unit	
	140	Sensor unit (A)	
	141	Sensor unit (B)	
	142	Door switch unit	
	143	Acetate Tape	REH1003
	144	2.5mm pitch side post (5P)	BS5P – SHF

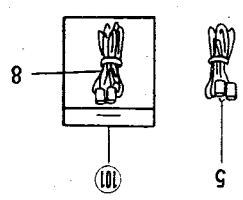
Mechanism Unit

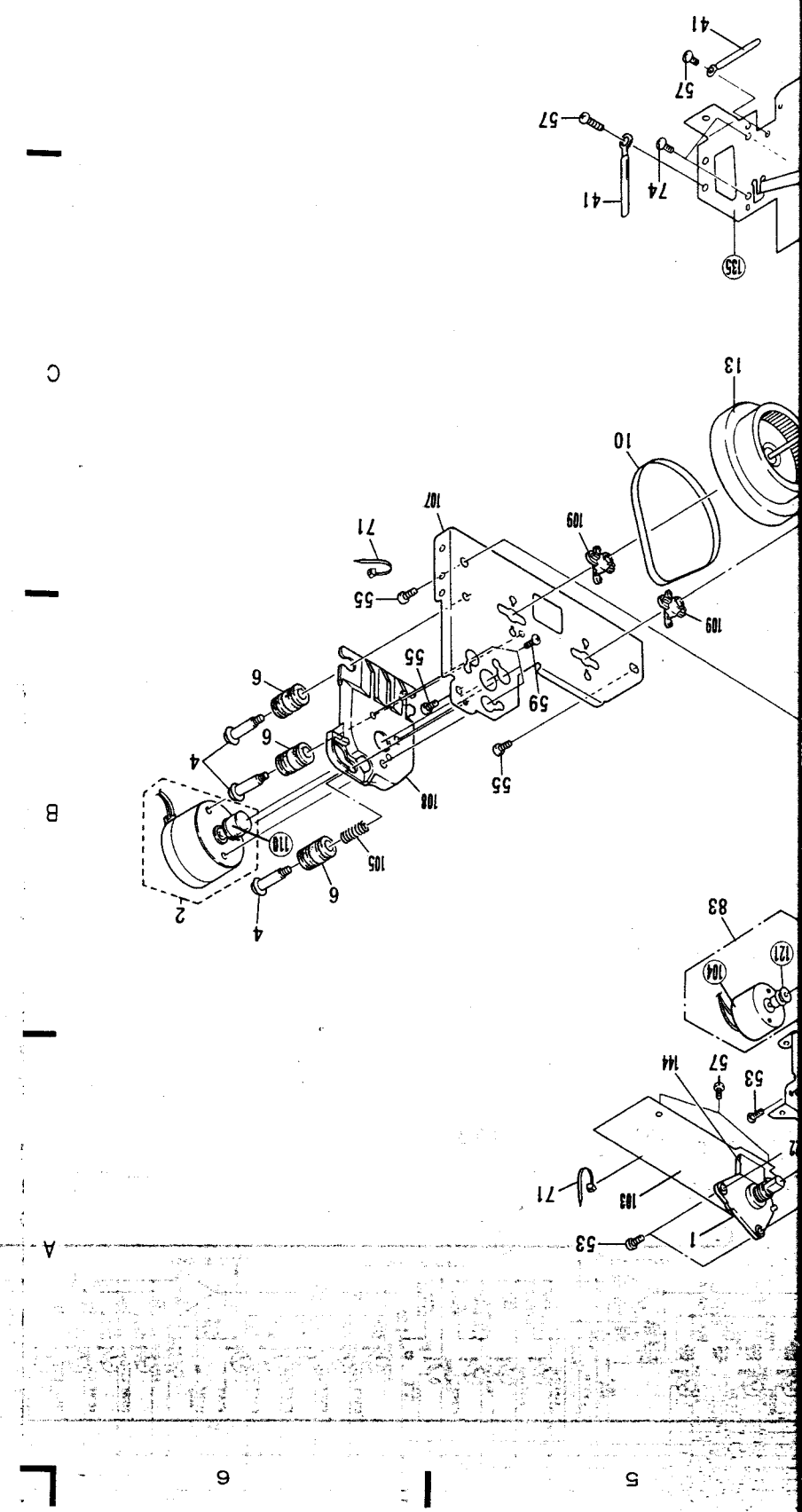


2. PACKING

Parts List

Mark	No.	Description	Part No.
	1	Pad (F)	RHA1021
	2	Pad (R)	RHA1022
	3	Packing case	RHG1276
	4	Sheet	RHX – 034
	5	Control cord	RDE1030
	6	Operating instructions (For HEM type)	RRE1044
	7	Operating instructions (For HEM type)	RRD1109
	8	Connection cord (For HB type)	RDE – 010
	9	Operating instructions	RRB1094
	101	Connection cord assembly	





1. RESISTORS :
   Indicated in Ω, 1/4W, 1/6W, ±5% tolerance unless otherwise noted k; kΩ, M; MΩ, (F); ±1%, (G); ±2%, (K); ±10%, (M); ±20% tolerance.

2. CAPACITORS :
   Indicated in capacity (μF)/voltage (V) unless otherwise noted p; pF.
   Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE CURRENT :
   ⌐¬ ; DC voltage (V) at no input signal.
   ←mA ; DC current at no input signal.

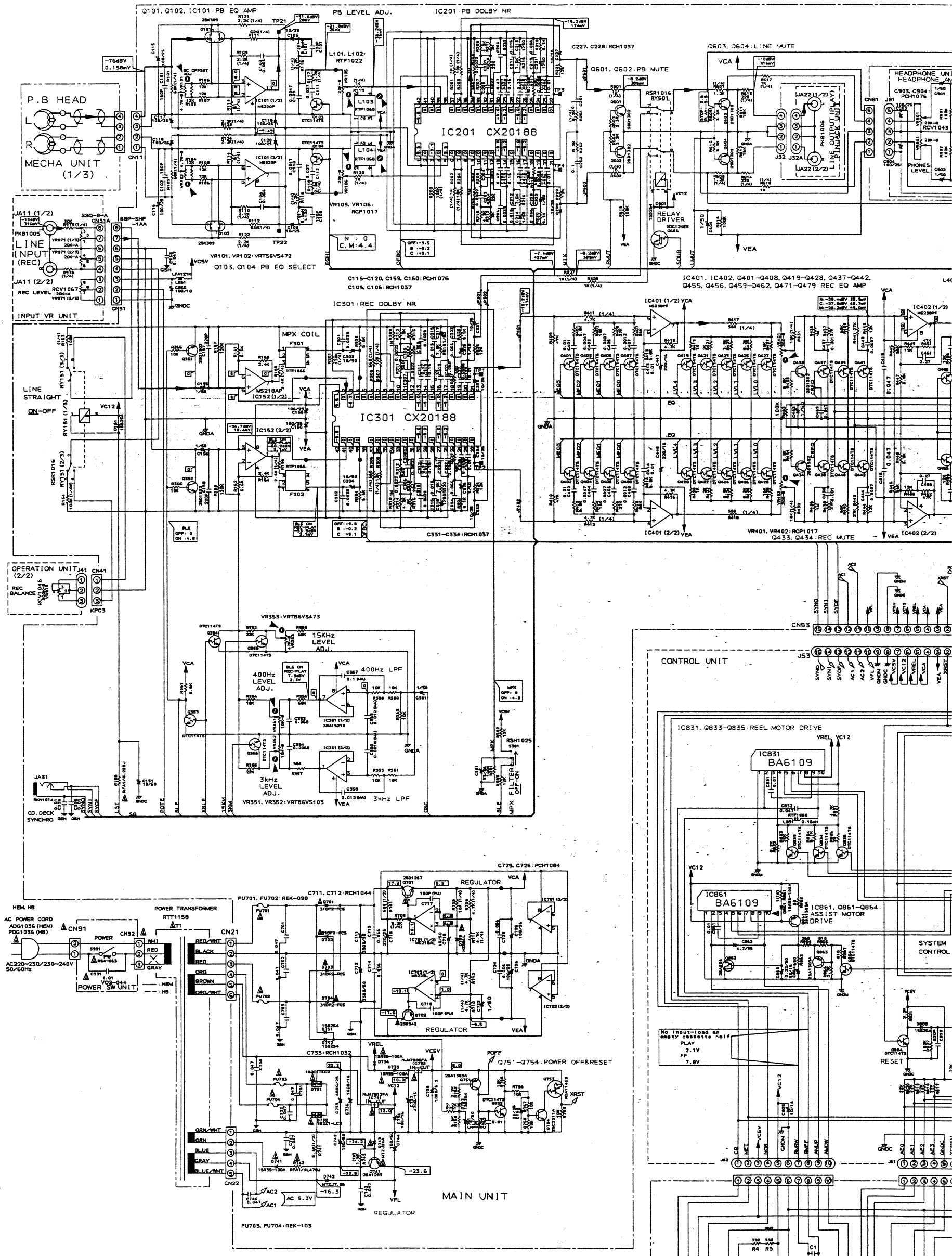
4. OTHERS :
   ➡ ; Signal route.
   ⊘ ; Adjusting point.
   The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
   ※ marked capacitors and resistors have parts numbers.

   This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

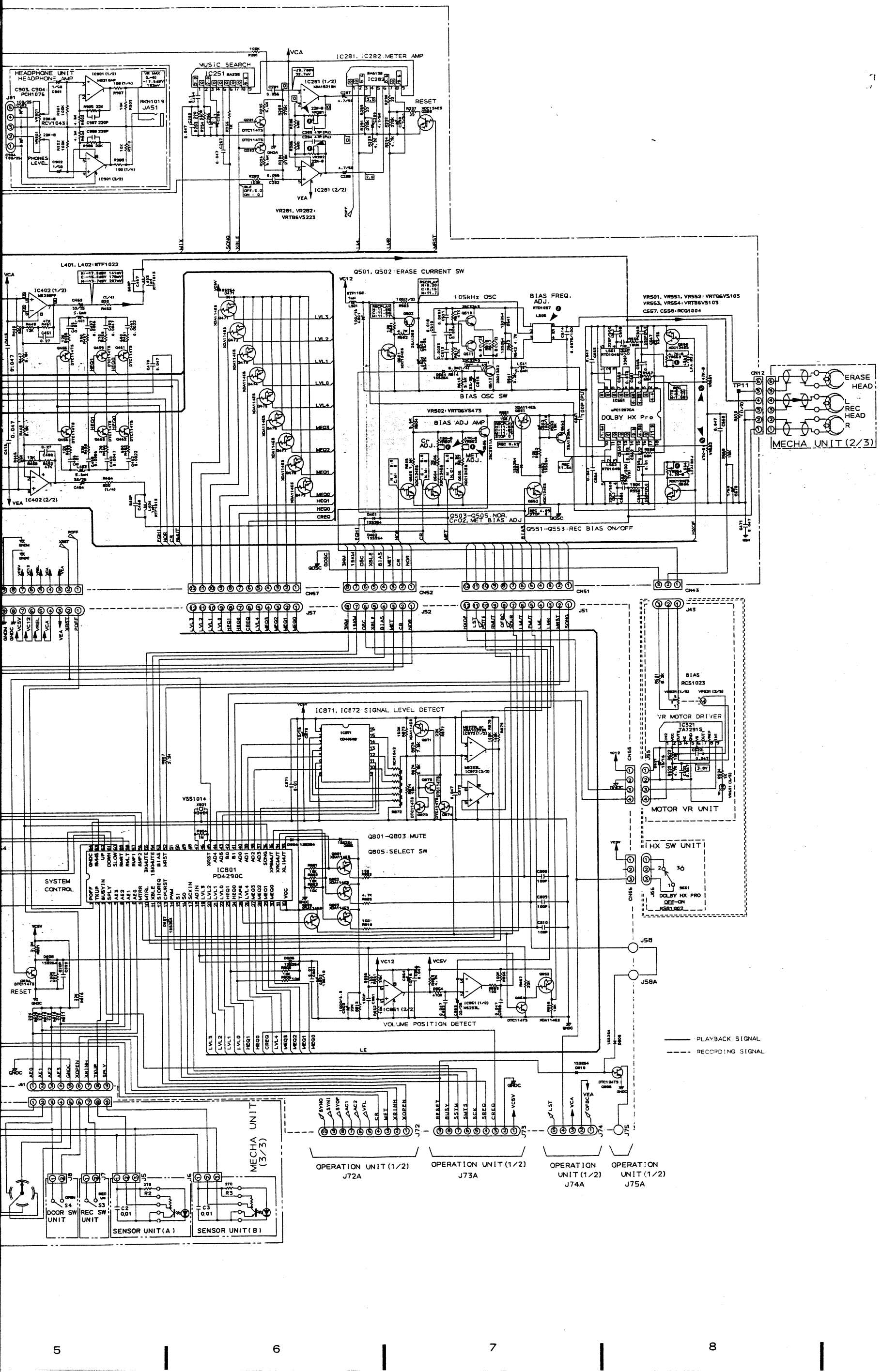
5. SWITCHES (Underline indicates switch position)
   OPERATION UNIT
   S921 : OPEN/CLOSE
   S922 : REW
   S923 : TAPE RETURN
   S924 : STOP
   S925 : COUNTER
   S926 : RESET
   S927 : PLAY
   S928 : METER RANGE
   S929 : FF
   S930 : PEAK MODE
   S931 : REC
   S932 : DISPLAY
   S933 : MONITOR SELECT
   S934 : PAUSE
   S935 : SYNCHRO
   S936 : REC/MUTE
   S951 : DOLBY NR B – OFF – C
   S961 : SUPER AUTO BLE

   POWER SW UNIT
   S991 : ON – OFF

3. SCHEMATIC DIAGRAM



	HEM, HB
FU701, FU702	T630mA/250V
FU703, FU704	T2A/250V


HEADPHONE UNIT
HEADPHONE AMP
C903, C904: PCH1076
RCV1043
RKN1019
JA51
PHONES LEVEL
MUSIC SEARCH
IC251
IC281, IC282 METER AMP
IC281 (1/2)
IC281 (2/2)
VCA
VEA
RESET
VR281, VR282: VRT86VS223
L401, L402: RTF1022
IC402 (1/2)
IC402 (2/2)
Q501, Q502: ERASE CURRENT SW
105kHz OSC
BIAS FREQ. ADJ.
BIAS OSC SW
VR502: VRTG6VS473
BIAS ADJ AMP
Cr ADJ.
MET ADJ.
DOLBY HX Pro
VRS01, VRS51, VRS52: VRTG6VS103
VRS53, VRS54: VRTB6VS103
CS57, CS58: RCG1004
ERASE HEAD
L REC HEAD
R
MECHA UNIT (2/3)
Q503–Q505: NOR, CrO2, MET BIAS ADJ
Q551–Q553: REC BIAS ON/OFF
IC871, IC872: SIGNAL LEVEL DETECT
Q801–Q803: MUTE
Q805: SELECT SW
IC801 PD4290C
SYSTEM CONTROL
VSS1014
BIAS RCS1023
VR MOTOR DRIVER
IC521 JA7291S
MOTOR VR UNIT
HX SW UNIT
DOLBY HX PRO QEE-ON RSR1002
VOLUME POSITION DETECT
MECHA UNIT (3/3)
DOOR SW UNIT
REC SW UNIT
SENSOR UNIT (A)
SENSOR UNIT (B)
OPERATION UNIT (1/2) J72A
OPERATION UNIT (1/2) J73A
OPERATION UNIT (1/2) J74A
OPERATION UNIT (1/2) J75A
PLAYBACK SIGNAL
RECORDING SIGNAL

CONTROL UNIT J72

CONTROL UNIT J73

CONTROL UNIT J74

CONTROL UNIT J75

TIMER SW UNIT

RSH1011

S981

PLAY (REPEAT)

OFF

TIMER

REC

J71

J71A

J72A

J73A

J74A

J75A

T-REC GNDC T-PLAY

SYNO SYNI SYOF AC1 AC2 VFL CR MET XRINH XOPEN

RESET BUSY SSTM SMTS SCK SREQ CREQ GNDC VC5V

LST HXOF VCA VEAV OFBC

Q921 : CD SYNCRO

Q922, Q923 : TIMER REC/PLAY SW

XDA114ES

Q922

Q923

XDC114ES

Q921

VSS1014

X921

IC921
PD3170A
OPERATION CONTROL&
FL DRIVER

NROFF SYNI SYOF NRBI NRCI GND NRSI BLE HXOF T-REC T-PLAY REMAINV BLE TYPE PLCSV CREQ SYNO BUSY SO SI SCKIN

CR MET XRINH XOPEN SREQ KI3 KI2 KI1 KI0 KO3 KO2 KO1 KO0 VCC

AC1 AC2 T0 T1 T2 T3 T4 T5 S00 S01 S02 S03 S04 S05 S06 S07 S08 S09 S10 S11 S12 S13 S14 S15 S16

V921
RAW1056

FL

Q925
2SC1740S

S941

RSG-150

SEL2215S

LINE
STRAIGHT
OFF-ON

S951 (1/2)

S951 (2/2)

RSB1001

Q924

XDC114ES

DOLBY NR
B-OFF-C

Q924 : DOLBY NR ON/OFF SW

OPEN/CLOSE

TAPE

COUNTER

RESET

REW

STOP

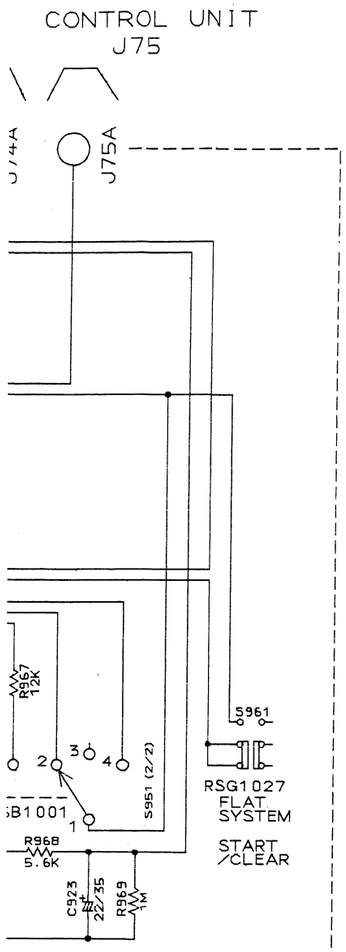
PLAY

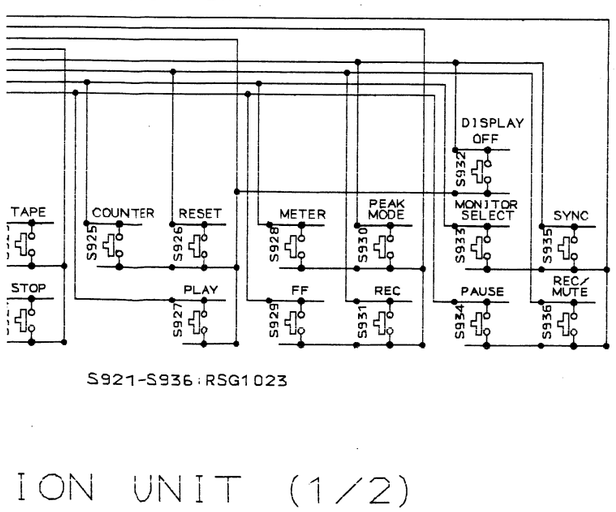
S921-S936 : RSG102

RSG102
FLAT
SYSTEM

START
/CLEA

OPERATION UNIT

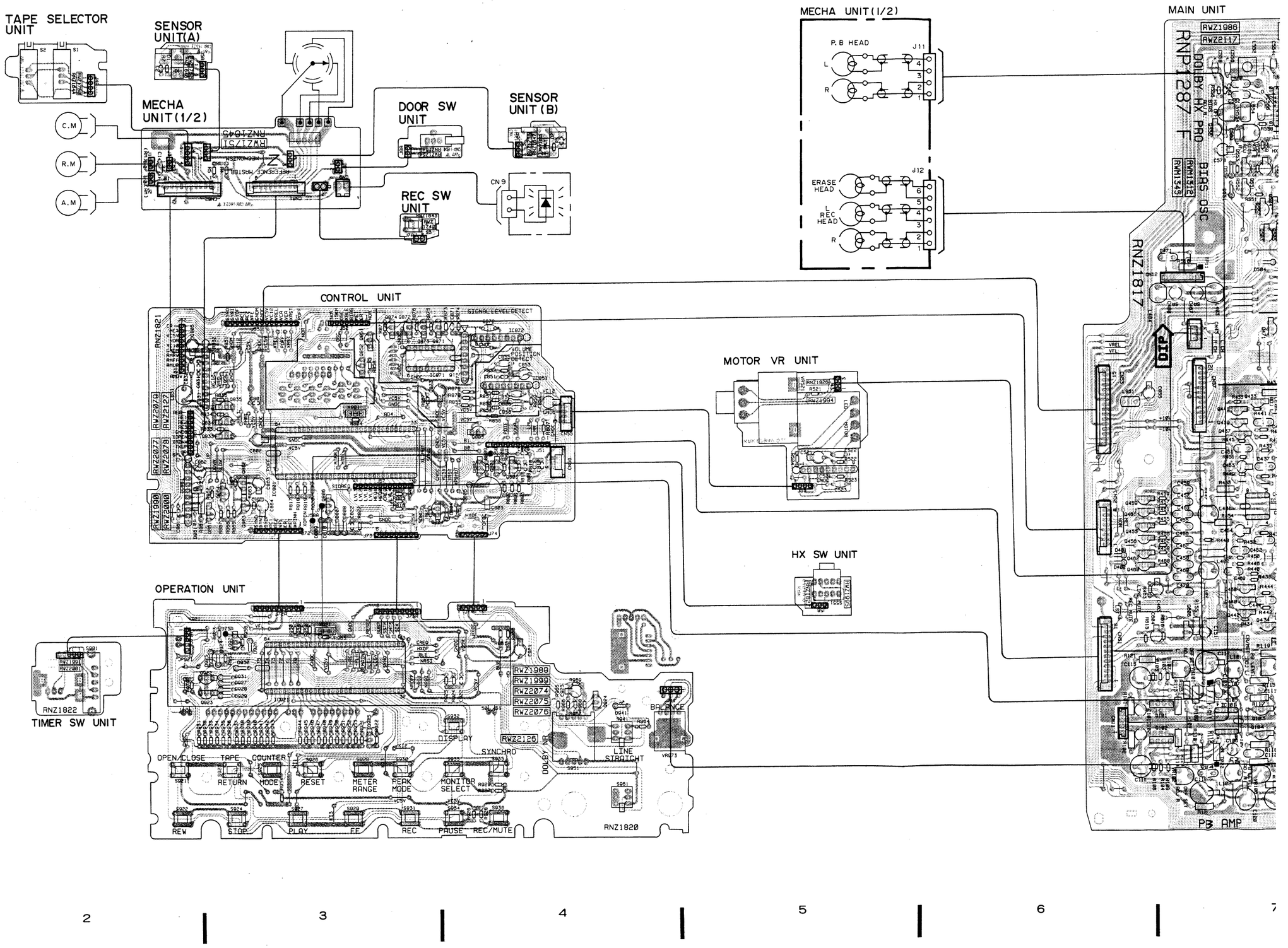


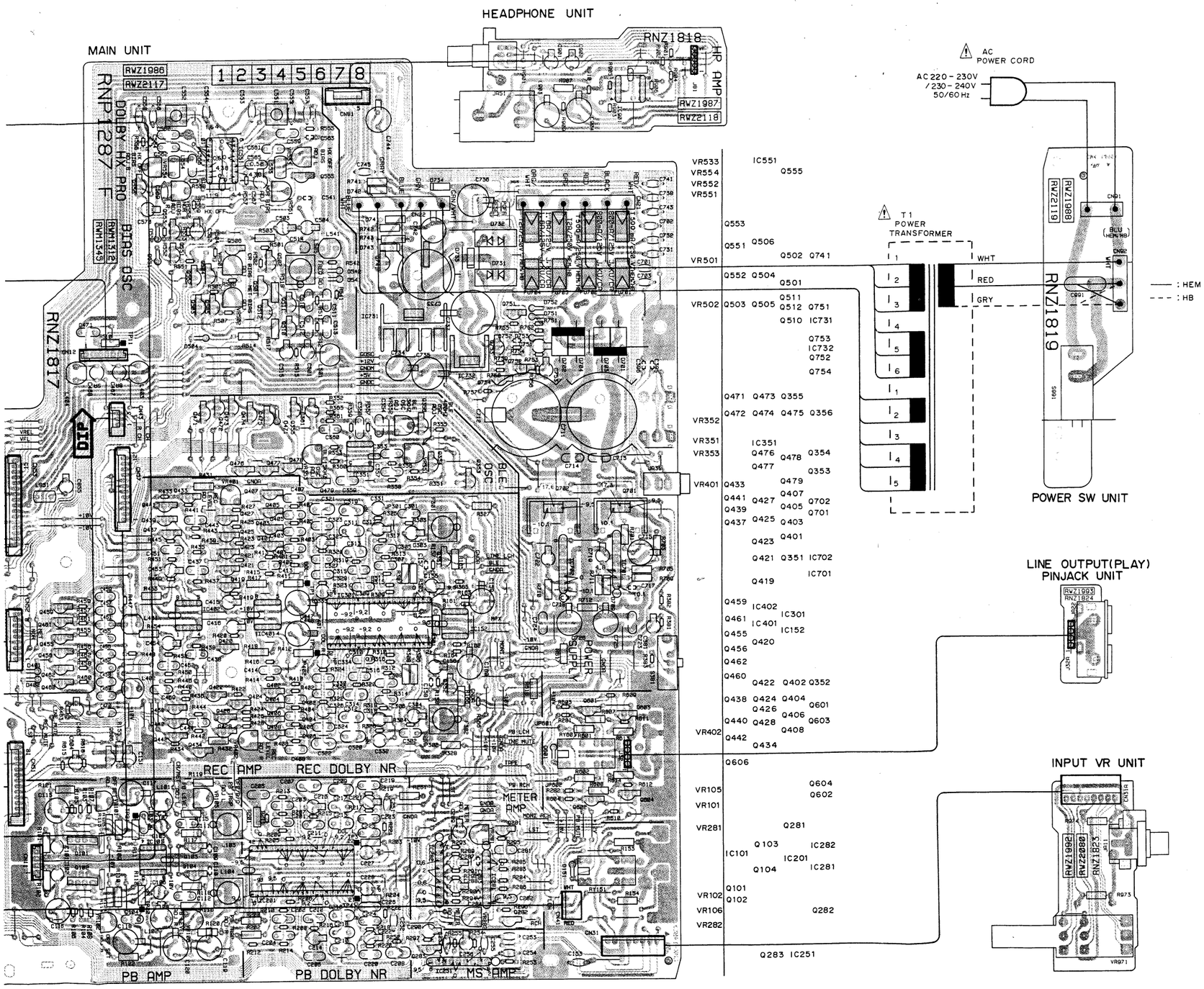


S921-S936:RSG1023

ION UNIT (1/2)

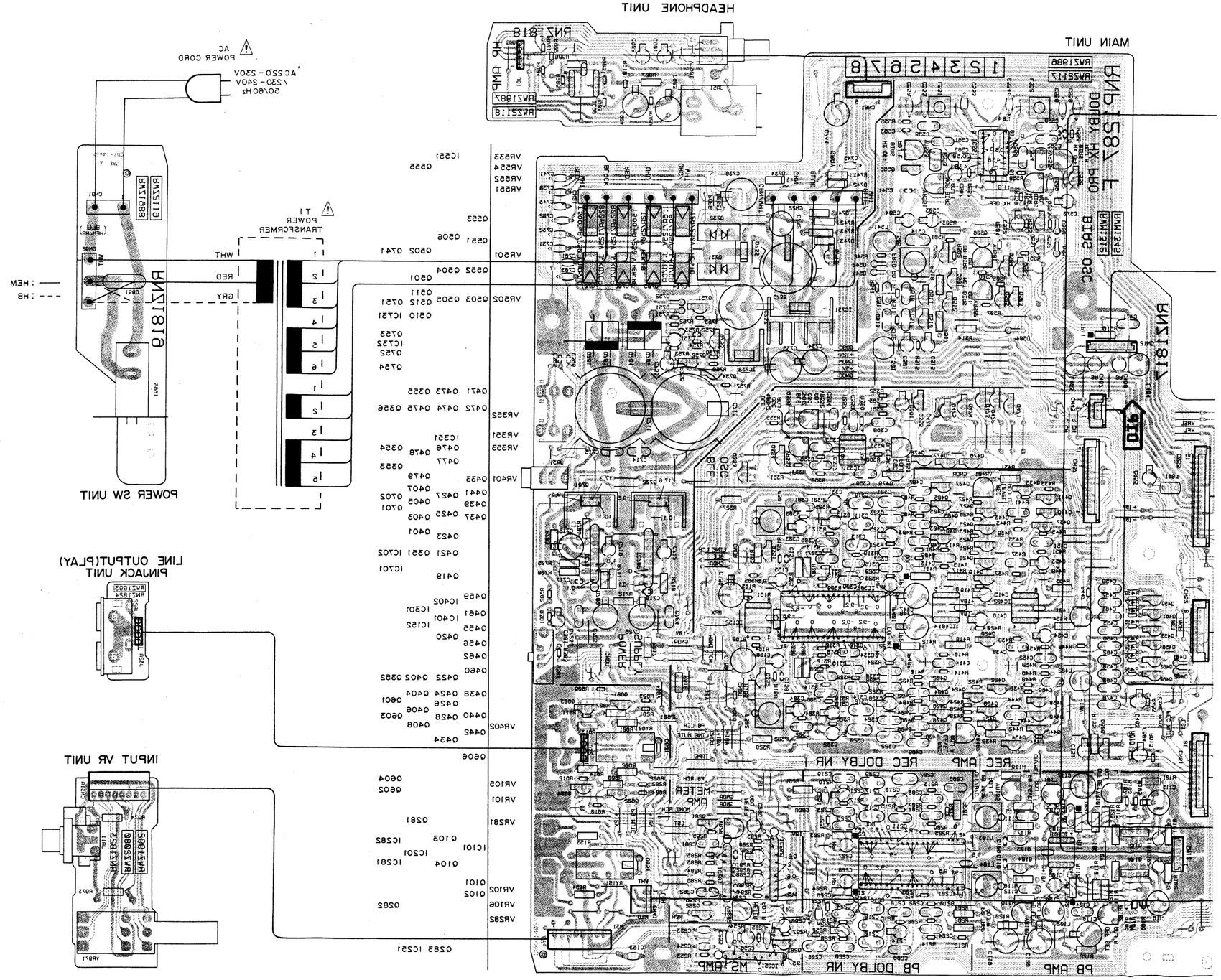
4. P.C. BOARDS CONNECTION DIAGRAM





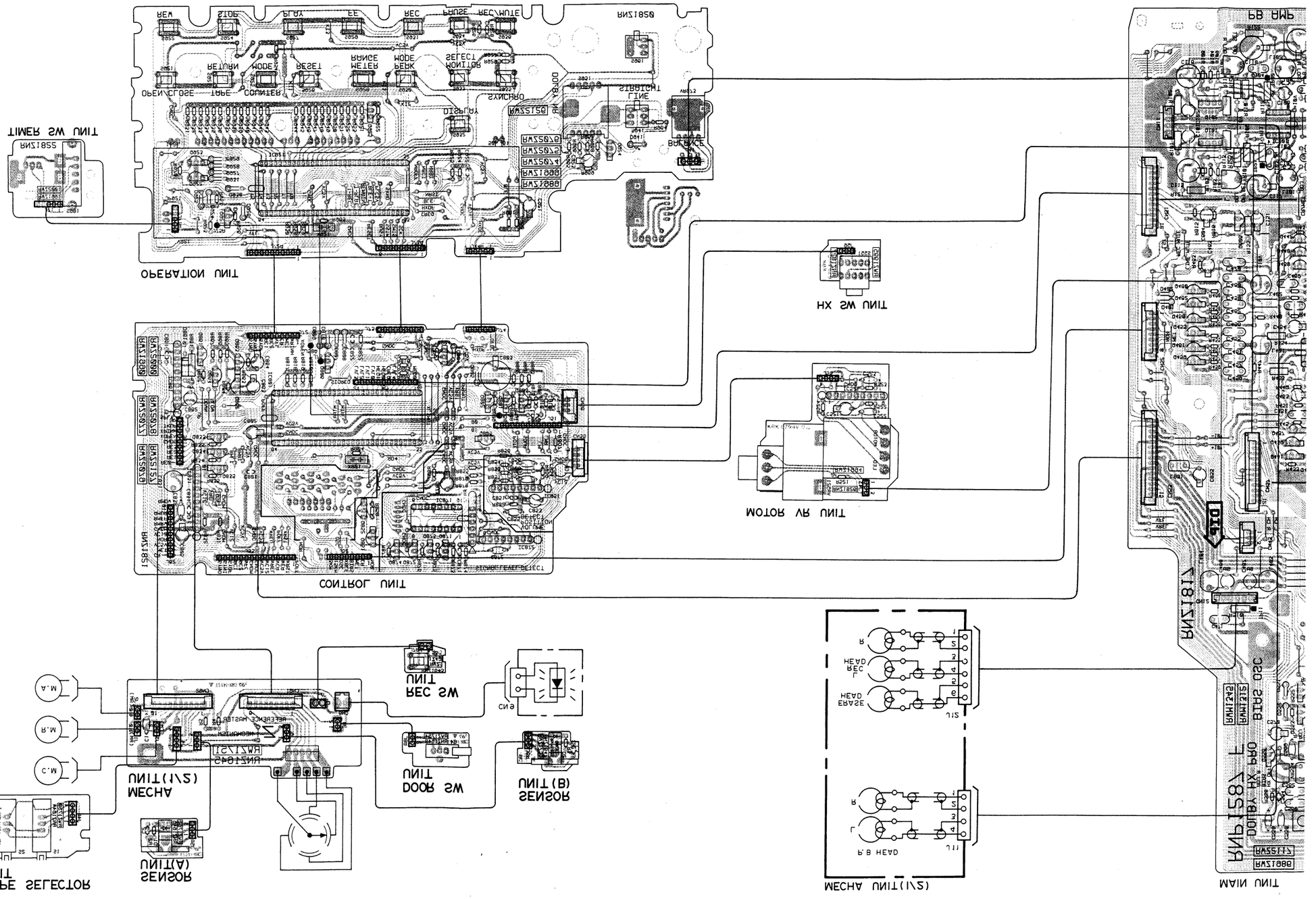
P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor
		FET
		Diode
		Zenner diode
		LED
		Varactor
		Tact switch
		Inductor
		Coil
		Transformer
		Filter
		Ceramic capacitor
		Mylar capacitor
		Styrol capacitor
		Electrolytic capacitor (Non polarized)
		Electrolytic capacitor (Noiseless)
		Electrolytic capacitor (Polarized)
		Electrolytic capacitor (Polarized)
		Power capacitor
		Semi-fixed resistor
		Resistor array
		Resistor
		Resonator
		Thermistor

1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with ▭ shows negative terminal.
4. The diode marked with ○ shows cathode side.
5. The transistor terminal marked with ▭ shows emitter.


HEADPHONE UNIT
MAIN UNIT
AC POWER CORD
AC 220 - 240V 50/60Hz
T1 POWER TRANSFORMER
POWER SW UNIT
LINE OUTPUT(PLAY) PINJACK UNIT
INPUT VR UNIT
: HEM
: HB
REC AMP
REC DOLBY NR
PB AMP
PB DOLBY NR
MS AMP
METER AMP
BIAS OSC
HX PRO
DOLBY

4. P.C. BOARDS CONNECTION DIAGRAM

• View from soldering side



5. P.C.B's PARTS LIST

NOTES:

- Parts without part number cannot be supplied.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%)

560Ω → 56 × 10¹ → 561 ..... RD1/4PS 5 6 1 J
47kΩ → 47 × 10³ → 473 ..... RD1/4PS 4 7 3 J
0.5Ω → 0R5 ..... RN2H 0 R 5 K
1Ω → 010 ..... RS1P 0 1 0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ → 562 × 10¹ → 5621 ..... RN1/4SR 5 6 2 1 F

Mark	No.	Description	Part No.
		INPUT VR UNIT	
		RESISTORS	
	R973, 974	CARBONFILM RESISTOR	RDR1/4PM□□□J
	VR971		RCV1067
		OTHERS	
	CN31	SSQ CONNECTOR 8P	SSQ-8-A
	JA11	JACK	PKB1005
		PINJACK UNIT	
		OTHERS	
	JA22	JACK	PKB1006
		MOTOR VR UNIT	
		SEMICONDUCTORS	
	IC521	MECHANISM DRIVER IC	TA7291S
		CAPACITORS	
	C521	ELECTR. CAPACITOR	CEAS100M16
	C522, 523	CERAMIC CAPACITOR	CKCYF473Z50
		RESISTORS	
	R521-524	CARBONFILM RESISTOR	RD1/6PM□□□J
	VR521	(5K)	RCS1023
		HX SW UNIT	
		SWITCHES	
	S551		RSB1002
		TIMER SW UNIT	
		SWITCHES	
	S981		RSH1011
		OPERATION UNIT	
		SEMICONDUCTORS	
	IC921		PD3170A
	Q921	DIGITAL TRANSISTOR	XDC114ES
	Q922, 923	DIGITAL TRANSISTOR	XDA114ES
	Q924	DIGITAL TRANSISTOR	XDC114ES
	Q925	TRANSISTOR	2SC1740S
	D924-931	DIODE	1SS254
	D941	LED	SEL2215S
		SWITCHES	
	S921-936	SWITCH	RSG1023
	S941	SWITCH	RSG-150
	S951		RSB1001
	S961	SWITCH	RSG1027
		CAPACITORS	
	C921	ELECTR. CAPACITOR	CEAS100M16
	C922	CERAMIC CAPACITOR	CKPUYY103N16
	C923	ELECTR. CAPACITOR	CEAS220M35
		RESISTORS	
	R921-954	CARBONFILM RESISTOR	RD1/6PM□□□J
	R956-961	CARBONFILM RESISTOR	RD1/6PM□□□J
	R963-970	CARBONFILM RESISTOR	RD1/6PM□□□J
	VR973	VARIABLE RESISTOR(200K)	RCV1046
		OTHERS	
	V921		RAW1056
	X921	CERAMIC RESONATOR	VSS1014
		CONTROL UNIT	
		SEMICONDUCTORS	
	IC801	MAIN CPU	PD4290C
	IC831	IC	BA6109
	IC851	DUAL-COMPARATOR IC	M5233L
	IC861	IC	BA6109
	IC871	LOGIC IC	CD4050B
	IC872	DUAL-COMPARATOR IC	M5233L
	Q801-803	DIGITAL TRANSISTOR	XDA114ES
	Q804	DIGITAL TRANSISTOR	DTC114TS
	Q805	DIGITAL TRANSISTOR	XDA114ES
	Q806	TRANSISTOR	DTC124TS
	Q833-835	DIGITAL TRANSISTOR	DTC114TS
	Q851	DIGITAL TRANSISTOR	DTC114TS
	Q852	DIGITAL TRANSISTOR	XDA114ES
	Q861	TRANSISTOR	2SA1309A
	Q862	TRANSISTOR	2SA936
	Q863	TRANSISTOR	2SA1309A
	Q864	DIGITAL TRANSISTOR	DTC114TS
	Q871	DIGITAL TRANSISTOR	XDA114ES
	Q872-874	DIGITAL TRANSISTOR	DTC114TS
	D804-810	DIODE	1SS254
⚠	D861	RECTIFIER DIODE	1SR35-100A
		COILS/TRANSFORMERS	
	L831		RTF1068
		CAPACITORS	
	C801	CERAMIC CAPACITOR	CKPUYY103N16
	C802	ELECTR. CAPACITOR	CEAS101M10
	C803	ELECTR. CAPACITOR	CEAS102M6R3
	C805	ELECTR. CAPACITOR	CEAS100M16
	C808-810	AXIAL CAPACITOR	CKPUYB101K50
	C822	AXIAL CAPACITOR	CKPUYB821K50
	C831	CERAMIC CAPACITOR	CKPUYY103N16
	C832	CERAMIC CAPACITOR	CKCYF473Z50
	C851	AXIAL CAPACITOR	CKPUYB101K50
	C852	CERAMIC CAPACITOR	CGCYX473K25
	C853	ELECTR. CAPACITOR	CEAS220M25
	C854	ELECTR. CAPACITOR	CEAS100M16
	C855	CERAMIC CAPACITOR	CKCYF473Z50
	C856	CERAMIC CAPACITOR	CGCYX473K25
	C861	CERAMIC CAPACITOR	CKPUYY103N16
	C862	ELECTR. CAPACITOR	CEANP4R7M35
	C863	ELECTR. CAPACITOR	CEASR22M50
	C864	ELECTR. CAPACITOR	CEAS330M16
	C871	CERAMIC CAPACITOR	CKPUYY103N16
	C872	CERAMIC CAPACITOR	CKCYF473Z50
	C873	ELECTR. CAPACITOR	CEAS100M16
		RESISTORS	
	R801-810	CARBONFILM RESISTOR	RD1/6PM□□□J
	R813	CARBONFILM RESISTOR	RD1/6PM□□□J
	R816-822	CARBONFILM RESISTOR	RD1/6PM□□□J
	R831-835	CARBONFILM RESISTOR	RD1/6PM□□□J
	R851-859	CARBONFILM RESISTOR	RD1/6PM□□□J
	R861	METAL OXIDE RESISTOR	RS1LMF□□□J
	R862-867	CARBONFILM RESISTOR	RD1/6PM□□□J
	R872	(10K)	RCX1042
	R873-876	METALFILM RESISTOR	RN1/6PQ□□□□F
	R877-879	CARBONFILM RESISTOR	RD1/6PM□□□J
		OTHERS	
	X801	CERAMIC RESONATOR	VSS1014
		MAIN UNIT	
		SEMICONDUCTORS	
	IC101	OP-AMP-IC	M5220P
	IC152	OP-AMP, IC	M5218AP
	IC201	DOLBY-B, C IC	CX20188
	IC251	IC	BA335
	IC281	OP-AMP IC	XRA15218N
	IC282		BA6138
	IC301	DOLBY-B, C IC	CX20188
	IC351	OP-AMP IC	XRA15218
	IC401, 402	OP AMP	M5238PF
	IC551	DOLBY HX PRO IC	UPC1297CA
	IC701	OP-AMP, IC	M5218AL
	IC702	OP-AMP IC	M5223L
⚠	IC731	REGULATOR IC	NJM7812FA
⚠	IC732	REGULATOR IC	NJM7805FA
	Q101, 102	N-DUAL-FET	2SK389
	Q103, 104	DIGITAL TRANSISTOR	DTC114TS
	Q281, 282	DIGITAL TRANSISTOR	DTC114TS
	Q283	TRANSISTOR	XDC124ES
	Q351, 352	TRANSISTOR	2SD1302
	Q353-356	DIGITAL TRANSISTOR	DTC114TS
	Q401-408	DIGITAL TRANSISTOR	DTC114TS
	Q419-428	DIGITAL TRANSISTOR	DTC114TS
	Q433, 434	TRANSISTOR	2SD1302
	Q437-442	DIGITAL TRANSISTOR	DTC114TS
	Q455, 456	DIGITAL TRANSISTOR	DTC114TS
	Q459-462	DIGITAL TRANSISTOR	DTC114TS
	Q471-479	DIGITAL TRANSISTOR	XDA114ES
	Q501	TRANSISTOR	XDC124ES
	Q502	TRANSISTOR	2SA1283
	Q503-505	TRANSISTOR	XDC124ES
	Q506	TRANSISTOR	2SC3311A
	Q510, 511	TRANSISTOR	2SC3243
	Q512	TRANSISTOR	2SD1302
	Q551	DIGITAL TRANSISTOR	XDA114ES
	Q552	TRANSISTOR	XDC124ES
	Q553	TRANSISTOR	2SA1309A
	Q555, 556	TRANSISTOR	XDC124ES
	Q601-604	TRANSISTOR	2SD1302
	Q606	TRANSISTOR	XDC124ES
⚠	Q701	TRANSISTOR	2SD1267
⚠	Q702	TRANSISTOR	2SB942
⚠	Q741	TRANSISTOR	2SA1283
	Q751	TRANSISTOR	2SA1309A
	Q752	DIGITAL TRANSISTOR	DTC114TS
	Q753	DIGITAL TRANSISTOR	XDA114ES
	Q754	TRANSISTOR	2SC3311A
	D151	DIODE	1SS254
	D401, 402	DIODE	1SS254
	D471	DIODE	1SS254
	D504	DIODE	1SS254
	D541, 542	DIODE	1SS254
	D551, 552	DIODE	1SS254
	D601	DIODE	1SS254
⚠	D701-704		31DF2-FC5
⚠	D709	ZENER DIODE	HZ5BLL
⚠	D731	POWER DIODE	1B2C1-LC2
⚠	D732	POWER DIODE	1B2Z1-LC2
⚠	D733, 734	RECRIFIER DIODE	1SR35-100A
⚠	D741	RECRIFIER DIODE	1SR35-100A
	D742	ZENER DIODE	MTZJ7.5B
⚠	D743	ZENER DIOD	
	D751-753	DIODE	
		SWITCHES	
	S381		
		RELAYS	
	RY151		
	RY601		
		COILS/TRANSFORM	
	L101, 102	COIL	
	L103, 104	COIL	
	L401, 402	COIL	
	L403, 404		
	L501		
	L505		
	L541	COIL	
	L551, 552		
	L553, 554	RADIAL	
	L851	RADIAL IN	
	F301, 302	FILTE	
		CAPACITORS	
	C101, 102	PL. ST	
	C103, 104	AUDIO	
	C105, 106	ELECT	
	C107, 108	CERAM	
	C109, 110	AUDIO	
	C111, 112	AUDIO	
	C115-120	(100/	
	C151	ELECTR. CA	
	C153	CERAMIC C	
	C155, 156	ELECT	
	C157, 158	AXIAL	
	C159, 160	(100/	
	C201-204	AUDIO	
	C205, 206	AUDIO	
	C207, 208	AUDIO	
	C209, 210	AUDIO	
	C211, 212	AUDIO	
	C213, 214	ELECT	
	C215, 216	AUDIO	
	C217, 218	AUDIO	
	C219, 220	AUDIO	
	C221, 222	ELECT	
	C223, 224		
	C225, 226	AUDIO	
	C227, 228	(10/	
	C251, 252	AUDIO	
	C253	AUDIO FI	
	C254, 255	AUDIO	
	C256	ELECTR. C	
	C257	AUDIO FI	
	C281, 282	AUDIO	
	C283, 284	AXIAL	
	C287-290	ELEC	

Mark	No.	Description	Part No.
⚠	D743	ZENER DIODE	MTZJ24A
	D751-753	DIODE	1SS254
SWITCHES			
	S381		RSH1025
RELAYS			
	RY151		RSR1016
	RY601		RSR1016
COILS/TRANSFORMERS			
	L101, 102	COIL	RTF1022
	L103, 104	COIL	RTF1060
	L401, 402	COIL	RTF1022
	L403, 404		RTF1013
	L501		RTF1160
	L505		RTD1057
	L541	COIL	RTF1022
	L551, 552		RTD1045
	L553, 554	RADIAL INDUCTOR	LFA182J
	L851	RADIAL INDUCTOR	LFA121K
	F301, 302	FILTER	RTF1066
CAPACITORS			
	C101, 102	PL. STYRENE CAPACITOR	CQSF151J50
	C103, 104	AUDIO FILM CAPACITOR	CFTXA563J50
	C105, 106	ELECTR. CAPACITOR	RCH1037
	C107, 108	CERAMIC CAPACITOR	CKPUYB121K50
	C109, 110	AUDIO FILM CAPACITOR	CFTXA472J50
	C111, 112	AUDIO FILM CAPACITOR	CFTXA273J50
	C115-120	(100/25)	PCH1076
	C151	ELECTR. CAPACITOR	CEAS100M50
	C153	CERAMIC CAPACITOR	CKCYF473Z50
	C155, 156	ELECTR. CAPACITOR	CEYA010M50
	C157, 158	AXIAL CAPACITOR	CKPUYB221K50
	C159, 160	(100/25)	PCH1076
	C201-204	AUDIO FILM CAPACITOR	CFTXA222J50
	C205, 206	AUDIO FILM CAPACITOR	CFTXA392J50
	C207, 208	AUDIO FILM CAPACITOR	CFTXA474J50
	C209, 210	AUDIO FILM CAPACITOR	CFTXA154J50
	C211, 212	AUDIO FILM CAPACITOR	CFTXA153J50
	C213, 214	ELECTR. CAPACITOR	CEYA010M50
	C215, 216	AUDIO FILM CAPACITOR	CFTXA224J50
	C217, 218	AUDIO FILM CAPACITOR	CFTXA683J50
	C219, 220	AUDIO FILM CAPACITOR	CFTXA563J50
	C221, 222	ELECTR. CAPACITOR	CEYA010M50
	C223, 224		CFTXA562J50
	C225, 226	AUDIO FILM CAPACITOR	CFTXA103J50
	C227, 228	(10/25)	RCH1037
	C251, 252	AUDIO FILM CAPACITOR	CFTXA104J50
	C253	AUDIO FILM CAPACITOR	CFTXA473J50
	C254, 255	AUDIO FILM CAPACITOR	CFTXA104J50
	C256	ELECTR. CAPACITOR	CEASR47M50
	C257	AUDIO FILM CAPACITOR	CFTXA473J50
	C281, 282	AUDIO FILM CAPACITOR	CFTXA563J50
	C283, 284	AXIAL CERAMIC C.	CCPUSL470J50
	C287-290	ELECTR. CAPACITOR	CEAS4R7M50

Mark	No.	Description	Part No.
	C301, 302	AUDIO FILM CAPACITOR	CFTXA392J50
	C303, 304	ELECTR. CAPACITOR	CEYA100M50
	C305-308	AUDIO FILM CAPACITOR	CFTXA222J50
	C309, 310	AUDIO FILM CAPACITOR	CFTXA392J50
	C311, 312	AUDIO FILM CAPACITOR	CFTXA474J50
	C313, 314	AUDIO FILM CAPACITOR	CFTXA154J50
	C315, 316	AUDIO FILM CAPACITOR	CFTXA153J50
	C317, 318	ELECTR. CAPACITOR	CEYA010M50
	C319, 320	AUDIO FILM CAPACITOR	CFTXA224J50
	C321, 322	AUDIO FILM CAPACITOR	CFTXA683J50
	C323, 324	AUDIO FILM CAPACITOR	CFTXA563J50
	C325, 326	ELECTR. CAPACITOR	CEYA010M50
	C327, 328		CFTXA562J50
	C329, 330	AUDIO FILM CAPACITOR	CFTXA103J50
	C331-334	ELECTR. CAPACITOR(10/25)	RCH1037
	C353	AUDIO FILM CAPACITOR	CFTXA683J50
	C354	AUDIO FILM CAPACITOR	CFTXA682J50
	C357	MYLOR FILM CAPACITOR	CQMA104J50
	C358, 359	MYLOR FILM CAPACITOR	CQMA123J50
	C360	MYLOR FILM CAPACITOR	CQMA182J50
	C361	ELECTR. CAPACITOR	CEAS010M50
	C381	ELECTR. CAPACITOR	CEAS330M35
	C395, 396	CERAMIC CAPACITOR	CKPUYF103Z25
	C401, 402	AUDIO FILM CAPACITOR	CFTXA103J50
	C403, 404	AUDIO FILM CAPACITOR	CFTXA472J50
	C405, 406		CFTXA272J50
	C407, 408	AUDIO FILM CAPACITOR	CFTXA122J50
	C413, 414	AUDIO FILM CAPACITOR	CFTXA103J50
	C415, 416	AUDIO FILM CAPACITOR	CFTXA473J50
	C437, 438		CFTXA102J50
	C443, 444		CFTXA272J50
	C447, 448	ELECTR. CAPACITOR	CEYA221M16
	C451, 452	AUDIO FILM CAPACITOR	CFTXA274J50
	C453, 454	ELECTR. CAPACITOR	CEYA330M25
	C455, 456	AUDIO FILM CAPACITOR	CFTXA103J50
	C457, 458		CFTXA562J50
	C459, 460	AUDIO FILM CAPACITOR	CFTXA472J50
	C461, 462	AUDIO FILM CAPACITOR	CFTXA222J50
	C463	ELECTR. CAPACITOR	CEAS010M50
	C467, 468	PL. STYRENE CAPACITOR	CQSA561J50
	C469-471	AUDIO FILM CAPACITOR	CFTXA473J50
	C501	ELECTR. CAPACITOR	CEAS101M16
	C503, 504	ELECTR. CAPACITOR	CEAS330M35
	C510	AUDIO FILM CAPACITOR	CFTXA183J50
	C511	AUDIO FILM CAPACITOR	CFTXA332J50
	C512	AUDIO FILM CAPACITOR	CFTXA682J50
	C513	AUDIO FILM CAPACITOR	CFTXA332J50
	C514	CAPACITOR	CQPA752J100
	C515	ELECTR. CAPACITOR	CEAS330M35
	C541	AXIAL CAPACITOR	CKPUYB101K50
	C552	ELECTR. CAPACITOR	CEAS101M16
	C553, 554	CERAMIC CAPACITOR	CKCYF473Z50
	C555, 556	CERAMIC CAPACITOR	CCCSL221K500
	C557, 558	(390P/500)	RCG1004

Mark	No.	Description	Part No.
	C559, 560	AUDIO FILM CAPACITOR	CFTXA333J50
	C561, 562	AUDIO FILM CAPACITOR	CFTXA223J50
	C563, 564	CERAMIC CAPACITOR	CKPUYB331K50
	C565, 566	AUDIO FILM CAPACITOR	CFTXA103J50
	C567	ELECTR. CAPACITOR	CEAS330M35
	C569	CERAMIC CAPACITOR	CKCYF473Z50
	C570	ELECTR. CAPACITOR	CEAS010M50
	C604	ELECTR. CAPACITOR	CEAS010M50
	C701-703	CERAMIC CAPACITOR	CKCYF473Z50
	C711	ELECTR. CAPACITOR(3300 μF)	RCH1048
	C712	ELECTR. CAPACITOR(3300 μF)	RCH1049
	C713, 714	AUDIO FILM CAPACITOR	CFTXA563J50
	C715	ELECTR. CAPACITOR	CEAS221M25
	C717, 718	AXIAL CAPACITOR	CKPUYB101K50
	C719	ELECTR. CAPACITOR	CEYA100M50
	C722	ELECTR. CAPACITOR	CEYA010M50
	C723, 724	AUDIO FILM CAPACITOR	CFTXA563J50
	C725, 726	(100/25)	PCH1084
	C731, 732	CERAMIC CAPACITOR	CKCYF473Z50
	C733	ELECTR. CAPACITOR(6800/25)	RCH1032
	C734	ELECTR. CAPACITOR	CEAS101M16
	C735	ELECTR. CAPACITOR	CEAS102M6R3
	C736	ELECTR. CAPACITOR	CEAS102M16
	C737	ELECTR. CAPACITOR	CEAS472M16
	C738	CERAMIC CAPACITOR	CKCYF473Z50
	C741	CERAMIC CAPACITOR	CKCYF473Z50
	C742	ELECTR. CAPACITOR	CEAS101M50
	C743	CERAMIC CAPACITOR	CKCYF473Z50
	C744	ELECTR. CAPACITOR	CEAS101M50
	C745	CERAMIC CAPACITOR	CKCYF473Z50
	C751	ELECTR. CAPACITOR	CEAS4R7M50
	C752	CERAMIC CAPACITOR	CKPUYF103Z25
	C753	ELECTR. CAPACITOR	CEAS330M35
	C855	ELECTR. CAPACITOR	CEAS101M10
RESISTORS			
	R101, 102	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R103-108	CARBONFILM RESISTOR	RD1/6PM□□□J
	R109-124	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R153, 154	CARBONFILM RESISTOR	RDR1/4PM□□□J
⚠	R155	FUSIBLE RESISTOR	RFA1/4L□□□J
	R157, 158	CARBONFILM RESISTOR	RD1/6PM□□□J
	R161-164	CARBONFILM RESISTOR	RD1/6PM□□□J
	R165, 166	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R200-204	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R205-222	CARBONFILM RESISTOR	RD1/6PM□□□J
	R251	CARBONFILM RESISTOR	RD1/4PM□□□J
	R252-255	CARBONFILM RESISTOR	RD1/6PM□□□J
	R281-286	CARBONFILM RESISTOR	RD1/6PM□□□J
	R289-297	CARBONFILM RESISTOR	RD1/6PM□□□J
	R301	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R303, 304	CARBONFILM RESISTOR	RD1/6PM□□□J
	R305-308	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R309-326	CARBONFILM RESISTOR	RD1/6PM□□□J
	R327, 328	CARBONFILM RESISTOR	RDR1/4PM□□□J

Mark	No.	Description	Part No.
	R351-361	CARBONFILM RESISTOR	RD1/6PM□□□J
	R363	CARBONFILM RESISTOR	RD1/6PM□□□J
	R365, 366	CARBONFILM RESISTOR	RD1/6PM□□□J
	R381-383	CARBONFILM RESISTOR	RD1/6PM□□□J
	R401-410	CARBONFILM RESISTOR	RD1/6PM□□□J
	R411, 412	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R413-416	CARBONFILM RESISTOR	RD1/6PM□□□J
	R417, 418	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R419-428	CARBONFILM RESISTOR	RD1/6PM□□□J
	R431, 432	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R433-452	CARBONFILM RESISTOR	RD1/6PM□□□J
	R453, 454	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R455-463	CARBONFILM RESISTOR	RD1/6PM□□□J
	R501, 502	CARBONFILM RESISTOR	RD1/6PM□□□J
	R503	CARBONFILM RESISTOR	RD1/2PMF□□□J
	R504-507	CARBONFILM RESISTOR	RD1/6PM□□□J
	R510	CARBONFILM RESISTOR	RD1/2LF□□□J
	R511, 512	CARBONFILM RESISTOR	RD1/6PM□□□J
	R514	CARBONFILM RESISTOR	RD1/4PM□□□J
	R515	CARBONFILM RESISTOR	RD1/6PM□□□J
	R517, 518	CARBONFILM RESISTOR	RD1/2PMF□□□J
	R541, 542	CARBONFILM RESISTOR	RD1/6PM□□□J
	R551-553	CARBONFILM RESISTOR	RD1/6PM□□□J
	R555-559	CARBONFILM RESISTOR	RD1/6PM□□□J
	R601, 602	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R603, 604	CARBONFILM RESISTOR	RD1/6PM□□□J
	R607, 608	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R609-612	CARBONFILM RESISTOR	RD1/6PM□□□J
	R613, 614	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R615, 616	CARBONFILM RESISTOR	RD1/6PM□□□J
	R617, 618	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R701	CARBONFILM RESISTOR	RD1/2PMF□□□J
	R703	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R705	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R709-712	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R741	CARBONFILM RESISTOR	RD1/2PMF□□□J
⚠	R742	FUSIBLE RESISTOR	RFA1/4L□□□J
	R743	METAL OXIDE RESISTOR	RS1LMF□□□J
	R751-759	CARBONFILM RESISTOR	RD1/6PM□□□J
	VR101, 102	VR	VRTS6VS472
	VR105, 106	(20K)	RCP1017
	VR281, 282	VR	VRTB6VS223
	VR351, 352	SEMI-FIXED RESISTOR	VRTB6VS103
	VR353	VR	VRTB6VS473
	VR401, 402	(20K)	RCP1017
	VR501	VR	VRTG6VS103
	VR502	VR	VRTG6VS473
	VR551, 552	VR	VRTG6VS473
	VR553, 554	VR	VRTB6VS472
OTHERS			
	CN31		B8P-SHF-1AA
	JA31	JACK	RKN1014

5. P.C.B's PARTS LIST

NOTES:

- Parts without part number cannot be supplied.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%)

560 Ω → 56 × 10^1 → 561 ····· RD1/4PS 5 6 1 J
47k Ω → 47 × 10^3 → 473 ····· RD1/4PS 4 7 3 J
0.5 Ω → 0R5 ····· RN2H 0 R 5 K
1 Ω → 010 ····· RS1P 0 1 0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → 562 × 10^1 → 5621 ····· RN1/4SR 5 6 2 1 F

Mark	No.	Description	Part No.
INPUT VR UNIT			
RESISTORS			
	R973, 974	CARBONFILM RESISTOR	RDR1/4PM□□□J
	VR971		RCV1067
OTHERS			
	CN31	SSQ CONNECTOR 8P	SSQ-8-A
	JA11	JACK	PKB1005
PINJACK UNIT			
OTHERS			
	JA22	JACK	PKB1006
MOTOR VR UNIT			
SEMICONDUCTORS			
	IC521	MECHANISM DRIVER IC	TA7291S
CAPACITORS			
	C521	ELECTR. CAPACITOR	CEAS100M16
	C522, 523	CERAMIC CAPACITOR	CKCYF473Z50
RESISTORS			
	R521-524	CARBONFILM RESISTOR	RD1/6PM□□□J
	VR521 (5K)		RCS1023
HX SW UNIT			
SWITCHES			
	S551		RSB1002
TIMER SW UNIT			
SWITCHES			
	S981		RSH1011
OPERATION UNIT			
SEMICONDUCTORS			
	IC921		PD3170A
	Q921	DIGITAL TRANSISTOR	XDC114ES
	Q922, 923	DIGITAL TRANSISTOR	XDA114ES
	Q924	DIGITAL TRANSISTOR	XDC114ES
	Q925	TRANSISTOR	2SC1740S
	D924-931	DIODE	1SS254
	D941	LED	SEL2215S
SWITCHES			
	S921-936	SWITCH	RSG1023
	S941	SWITCH	RSG-150
	S951		RSB1001
	S961	SWITCH	RSG1027
CAPACITORS			
	C921	ELECTR. CAPACITOR	CEAS100M16
	C922	CERAMIC CAPACITOR	CKPUYY103N16
	C923	ELECTR. CAPACITOR	CEAS220M35
RESISTORS			
	R921-954	CARBONFILM RESISTOR	RD1/6PM□□□J
	R956-961	CARBONFILM RESISTOR	RD1/6PM□□□J
	R963-970	CARBONFILM RESISTOR	RD1/6PM□□□J
	VR973	VARIABLE RESISTOR(200K)	RCV1046
OTHERS			
	V921		RAW1056
	X921	CERAMIC RESONATOR	VSS1014
CONTROL UNIT			
SEMICONDUCTORS			
	IC801	MAIN CPU	PD4290C
	IC831	IC	BA6109
	IC851	DUAL-COMPARATOR IC	M52331
	IC861	IC	BA6109
	IC871	LOGIC IC	CD4050B
	IC872	DUAL-COMPARATOR IC	M52331
	Q801-803	DIGITAL TRANSISTOR	XDA114ES
	Q804	DIGITAL TRANSISTOR	DTC114TS
	Q805	DIGITAL TRANSISTOR	XDA114ES
	Q806	TRANSISTOR	DTC124TS
	Q833-835	DIGITAL TRANSISTOR	DTC114TS
	Q851	DIGITAL TRANSISTOR	DTC114TS
	Q852	DIGITAL TRANSISTOR	XDA114ES
	Q861	TRANSISTOR	2SA1319A

Mark	No.	Description	Part No.
	Q862	TRANSISTOR	2SA936
	Q863	TRANSISTOR	2SA1309A
	Q864	DIGITAL TRANSISTOR	DTC114TS
	Q871	DIGITAL TRANSISTOR	XDA114ES
	Q872-874	DIGITAL TRANSISTOR	DTC114TS
	D804-810	DIODE	1SS254
⚠	D861	RECTIFIER DIODE	1SR35-100A
COILS/TRANSFORMERS			
	L831		RTF1068
CAPACITORS			
	C801	CERAMIC CAPACITOR	CKPUYY103N16
	C802	ELECTR. CAPACITOR	CEAS101M10
	C803	ELECTR. CAPACITOR	CEAS102M6R3
	C805	ELECTR. CAPACITOR	CEAS100M16
	C808-810	AXIAL CAPACITOR	CKPUYB101K50
	C822	AXIAL CAPACITOR	CKPUYB821K50
	C831	CERAMIC CAPACITOR	CKPUYY103N16
	C832	CERAMIC CAPACITOR	CKCYF473Z50
	C851	AXIAL CAPACITOR	CKPUYB101K50
	C852	CERAMIC CAPACITOR	CGCYX473K25
	C853	ELECTR. CAPACITOR	CEAS220M25
	C854	ELECTR. CAPACITOR	CEAS100M16
	C855	CERAMIC CAPACITOR	CKCYF473Z50
	C856	CERAMIC CAPACITOR	CGCYX473K25
	C861	CERAMIC CAPACITOR	CKPUYY103N16
	C862	ELECTR. CAPACITOR	CEANP4R7M35
	C863	ELECTR. CAPACITOR	CEASR22M50
	C864	ELECTR. CAPACITOR	CEAS330M16
	C871	CERAMIC CAPACITOR	CKPUYY103N16
	C872	CERAMIC CAPACITOR	CKCYF473Z50
	C873	ELECTR. CAPACITOR	CEAS100M16
RESISTORS			
	R801-810	CARBONFILM RESISTOR	RD1/6PM□□□J
	R813	CARBONFILM RESISTOR	RD1/6PM□□□J
	R816-822	CARBONFILM RESISTOR	RD1/6PM□□□J
	R831-835	CARBONFILM RESISTOR	RD1/6PM□□□J
	R851-859	CARBONFILM RESISTOR	RD1/6PM□□□J
	R861	METAL OXIDE RESISTOR	RS1LMF□□□J
	R862-867	CARBONFILM RESISTOR	RD1/6PM□□□J
	R872	(10K)	RCX1042
	R873-876	METALFILM RESISTOR	RN1/6PQ□□□□F
	R877-879	CARBONFILM RESISTOR	RD1/6PM□□□J
OTHERS			
	X801	CERAMIC RESONATOR	VSS1014

MAIN UNIT

SEMICONDUCTORS

	IC101	OP-AMP-IC	M5220P
	IC152	OP-AMP, IC	M5218AP
	IC201	DOLBY-B, C IC	CX20188
	IC251	IC	BA335
	IC281	OP-AMP IC	XRA15218N
	IC282		BA6138
	IC301	DOLBY-B, C IC	CX20188
	IC351	OP-AMP IC	XRA15218
	IC401, 402	OP AMP	M5238PF
	IC551	DOLBY HX PRO IC	UPC1297CA
	IC701	OP-AMP, IC	M5218AL
	IC702	OP-AMP IC	M5223L
⚠	IC731	REGULATOR IC	NJM7812FA
⚠	IC732	REGULATOR IC	NJM7805FA
	Q101, 102	N-DUAL-FET	2SK389
	Q103, 104	DIGITAL TRANSISTOR	DTC114TS
	Q281, 282	DIGITAL TRANSISTOR	DTC114TS
	Q283	TRANSISTOR	XDC124ES
	Q351, 352	TRANSISTOR	2SD1302
	Q353-356	DIGITAL TRANSISTOR	DTC114TS
	Q401-408	DIGITAL TRANSISTOR	DTC114TS
	Q419-428	DIGITAL TRANSISTOR	DTC114TS
	Q433, 434	TRANSISTOR	2SD1302
	Q437-442	DIGITAL TRANSISTOR	DTC114TS
	Q455, 456	DIGITAL TRANSISTOR	DTC114TS
	Q459-462	DIGITAL TRANSISTOR	DTC114TS
	Q471-479	DIGITAL TRANSISTOR	XDA114ES
	Q501	TRANSISTOR	XDC124ES
	Q502	TRANSISTOR	2SA1283
	Q503-505	TRANSISTOR	XDC124ES
	Q506	TRANSISTOR	2SC3311A
	Q510, 511	TRANSISTOR	2SC3243
	Q512	TRANSISTOR	2SD1302
	Q551	DIGITAL TRANSISTOR	XDA114ES
	Q552	TRANSISTOR	XDC124ES
	Q553	TRANSISTOR	2SA1309A
	Q555, 556	TRANSISTOR	XDC124ES
	Q601-604	TRANSISTOR	2SD1302
	Q606	TRANSISTOR	XDC124ES
⚠	Q701	TRANSISTOR	2SD1267
⚠	Q702	TRANSISTOR	2SB942
⚠	Q741	TRANSISTOR	2SA1283
	Q751	TRANSISTOR	2SA1309A
	Q752	DIGITAL TRANSISTOR	DTC114TS
	Q753	DIGITAL TRANSISTOR	XDA114ES
	Q754	TRANSISTOR	2SC3311A
	D151	DIODE	1SS254
	D401, 402	DIODE	1SS254
	D471	DIODE	1SS254
	D504	DIODE	1SS254
	D541, 542	DIODE	1SS254
	D551, 552	DIODE	1SS254
	D601	DIODE	1SS254
⚠	D701-704		31DF2-FC5
⚠	D709	ZENER DIODE	HZ5BLL
⚠	D731	POWER DIODE	1B2C1-LC2
⚠	D732	POWER DIODE	1B2Z1-LC2
⚠	D733, 734	RECRIFIER DIODE	1SR35-100A
⚠	D741	RECRIFIER DIODE	1SR35-100A
	D742	ZENER DIODE	MTZJ7.5B

Mark	No.	Description	Part No.
⚠	D743	ZENER DIODE	MTZJ24A
	D751-753	DIODE	1SS254
SWITCHES			
	S381		RSH1025
RELAYS			
	RY151		RSR1016
	RY601		RSR1016
COILS/TRANSFORMERS			
	L101, 102	COIL	RTF1022
	L103, 104	COIL	RTF1060
	L401, 402	COIL	RTF1022
	L403, 404		RTF1013
	L501		RTF1160
	L505		RTD1057
	L541	COIL	RTF1022
	L551, 552		RTD1045
	L553, 554	RADIAL INDUCTOR	LFA182J
	L851	RADIAL INDUCTOR	LFA121K
	F301, 302	FILTER	RTF1066
CAPACITORS			
	C101, 102	PL. STYRENE CAPACITOR	CQSF151J50
	C103, 104	AUDIO FILM CAPACITOR	CFTXA563J50
	C105, 106	ELECTR. CAPACITOR	RCH1037
	C107, 108	CERAMIC CAPACITOR	CKPUYB121K50
	C109, 110	AUDIO FILM CAPACITOR	CFTXA472J50
	C111, 112	AUDIO FILM CAPACITOR	CFTXA273J50
	C115-120 (100/25)		PCH1076
	C151	ELECTR. CAPACITOR	CEAS100M50
	C153	CERAMIC CAPACITOR	CKCYF473Z50
	C155, 156	ELECTR. CAPACITOR	CEYA010M50
	C157, 158	AXIAL CAPACITOR	CKPUYB221K50
	C159, 160 (100/25)		PCH1076
	C201-204	AUDIO FILM CAPACITOR	CFTXA222J50
	C205, 206	AUDIO FILM CAPACITOR	CFTXA392J50
	C207, 208	AUDIO FILM CAPACITOR	CFTXA474J50
	C209, 210	AUDIO FILM CAPACITOR	CFTXA154J50
	C211, 212	AUDIO FILM CAPACITOR	CFTXA153J50
	C213, 214	ELECTR. CAPACITOR	CEYA010M50
	C215, 216	AUDIO FILM CAPACITOR	CFTXA224J50
	C217, 218	AUDIO FILM CAPACITOR	CFTXA683J50
	C219, 220	AUDIO FILM CAPACITOR	CFTXA563J50
	C221, 222	ELECTR. CAPACITOR	CEYA010M50
	C223, 224		CFTXA562J50
	C225, 226	AUDIO FILM CAPACITOR	CFTXA103J50
	C227, 228 (10/25)		RCH1037
	C251, 252	AUDIO FILM CAPACITOR	CFTXA104J50
	C253	AUDIO FILM CAPACITOR	CFTXA473J50
	C254, 255	AUDIO FILM CAPACITOR	CFTXA104J50
	C256	ELECTR. CAPACITOR	CEASR47M50
	C257	AUDIO FILM CAPACITOR	CFTXA473J50
	C281, 282	AUDIO FILM CAPACITOR	CFTXA563J50
	C283, 284	AXIAL CERAMIC C.	CCPUSL470J50
	C287-290	ELECTR. CAPACITOR	CEAS4R7M50

Mark	No.	Description	Part No.
	C301, 302	AUDIO FILM CAPACITOR	CFTXA392J50
	C303, 304	ELECTR. CAPACITOR	CEYA100M50
	C305-308	AUDIO FILM CAPACITOR	CFTXA222J50
	C309, 310	AUDIO FILM CAPACITOR	CFTXA392J50
	C311, 312	AUDIO FILM CAPACITOR	CFTXA474J50
	C313, 314	AUDIO FILM CAPACITOR	CFTXA154J50
	C315, 316	AUDIO FILM CAPACITOR	CFTXA153J50
	C317, 318	ELECTR. CAPACITOR	CEYA010M50
	C319, 320	AUDIO FILM CAPACITOR	CFTXA224J50
	C321, 322	AUDIO FILM CAPACITOR	CFTXA683J50
	C323, 324	AUDIO FILM CAPACITOR	CFTXA563J50
	C325, 326	ELECTR. CAPACITOR	CEYA010M50
	C327, 328		CFTXA562J50
	C329, 330	AUDIO FILM CAPACITOR	CFTXA103J50
	C331-334	ELECTR. CAPACITOR(10/25)	RCH1037
	C353	AUDIO FILM CAPACITOR	CFTXA683J50
	C354	AUDIO FILM CAPACITOR	CFTXA682J50
	C357	MYLOR FILM CAPACITOR	CQMA104J50
	C358, 359	MYLOR FILM CAPACITOR	CQMA123J50
	C360	MYLOR FILM CAPACITOR	CQMA182J50
	C361	ELECTR. CAPACITOR	CEAS010M50
	C381	ELECTR. CAPACITOR	CEAS330M35
	C395, 396	CERAMIC CAPACITOR	CKPUYF103Z25
	C401, 402	AUDIO FILM CAPACITOR	CFTXA103J50
	C403, 404	AUDIO FILM CAPACITOR	CFTXA472J50
	C405, 406		CFTXA272J50
	C407, 408	AUDIO FILM CAPACITOR	CFTXA122J50
	C413, 414	AUDIO FILM CAPACITOR	CFTXA103J50
	C415, 416	AUDIO FILM CAPACITOR	CFTXA473J50
	C437, 438		CFTXA103J50
	C443, 444		CFTXA272J50
	C447, 448	ELECTR. CAPACITOR	CEYA221M16
	C451, 452	AUDIO FILM CAPACITOR	CFTXA272J50
	C453, 454	ELECTR. CAPACITOR	CEYA330M25
	C455, 456	AUDIO FILM CAPACITOR	CFTXA103J50
	C457, 458		CFTXA562J50
	C459, 460	AUDIO FILM CAPACITOR	CFTXA472J50
	C461, 462	AUDIO FILM CAPACITOR	CFTXA222J50
	C463	ELECTR. CAPACITOR	CEAS010M50
	C467, 468	PL. STYRENE CAPACITOR	CQSA561J50
	C469-471	AUDIO FILM CAPACITOR	CFTXA473J50
	C501	ELECTR. CAPACITOR	CEAS101M16
	C503, 504	ELECTR. CAPACITOR	CEAS330M35
	C510	AUDIO FILM CAPACITOR	CFTXA183J50
	C511	AUDIO FILM CAPACITOR	CFTXA332J50
	C512	AUDIO FILM CAPACITOR	CFTXA682J50
	C513	AUDIO FILM CAPACITOR	CFTXA332J50
	C514	CAPACITOR	CQPA752J100
	C515	ELECTR. CAPACITOR	CEAS330M35
	C541	AXIAL CAPACITOR	CKPUYB102K50
	C552	ELECTR. CAPACITOR	CEAS101M16
	C553, 554	CERAMIC CAPACITOR	CKCYF473Z50
	C555, 556	CERAMIC CAPACITOR	CCCSL222K500
	C557, 558 (390P/500)		RCG1004

Mark	No.	Description	Part No.
	C559, 560	AUDIO FILM CAPACITOR	CFTXA333J50
	C561, 562	AUDIO FILM CAPACITOR	CFTXA223J50
	C563, 564	CERAMIC CAPACITOR	CKPUYB331K50
	C565, 566	AUDIO FILM CAPACITOR	CFTXA103J50
	C567	ELECTR. CAPACITOR	CEAS330M35
	C569	CERAMIC CAPACITOR	CKCYF473Z50
	C570	ELECTR. CAPACITOR	CEAS010M50
	C604	ELECTR. CAPACITOR	CEAS010M50
	C701-703	CERAMIC CAPACITOR	CKCYF473Z50
	C711	ELECTR. CAPACITOR(3300 μF)	RCH1048
	C712	ELECTR. CAPACITOR(3300 μF)	RCH1049
	C713, 714	AUDIO FILM CAPACITOR	CFTXA563J50
	C715	ELECTR. CAPACITOR	CEAS221M25
	C717, 718	AXIAL CAPACITOR	CKPUYB101K50
	C719	ELECTR. CAPACITOR	CEYA100M50
	C722	ELECTR. CAPACITOR	CEYA010M50
	C723, 724	AUDIO FILM CAPACITOR	CFTXA563J50
	C725, 726	(100/25)	PCH1084
	C731, 732	CERAMIC CAPACITOR	CKCYF473Z50
	C733	ELECTR. CAPACITOR(6800/25)	RCH1032
	C734	ELECTR. CAPACITOR	CEAS101M16
	C735	ELECTR. CAPACITOR	CEAS102M6R3
	C736	ELECTR. CAPACITOR	CEAS102M16
	C737	ELECTR. CAPACITOR	CEAS472M16
	C738	CERAMIC CAPACITOR	CKCYF473Z50
	C741	CERAMIC CAPACITOR	CKCYF473Z50
	C742	ELECTR. CAPACITOR	CEAS101M50
	C743	CERAMIC CAPACITOR	CKCYF473Z50
	C744	ELECTR. CAPACITOR	CEAS101M50
	C745	CERAMIC CAPACITOR	CKCYF473Z50
	C751	ELECTR. CAPACITOR	CEAS4R7M50
	C752	CERAMIC CAPACITOR	CKPUYF103Z25
	C753	ELECTR. CAPACITOR	CEAS330M35
	C855	ELECTR. CAPACITOR	CEAS101M10

RESISTORS

	R101, 102	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R103-108	CARBONFILM RESISTOR	RD1/6PM□□□J
	R109-124	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R153, 154	CARBONFILM RESISTOR	RDR1/4PM□□□J
⚠	R155	FUSIBLE RESISTOR	RFA1/4L□□□J
	R157, 158	CARBONFILM RESISTOR	RD1/6PM□□□J
	R161-164	CARBONFILM RESISTOR	RD1/6PM□□□J
	R165, 166	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R200-204	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R205-222	CARBONFILM RESISTOR	RD1/6PM□□□J
	R251	CARBONFILM RESISTOR	RD1/4PM□□□J
	R252-255	CARBONFILM RESISTOR	RD1/6PM□□□J
	R281-286	CARBONFILM RESISTOR	RD1/6PM□□□J
	R289-297	CARBONFILM RESISTOR	RD1/6PM□□□J
	R301	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R303, 304	CARBONFILM RESISTOR	RD1/6PM□□□J
	R305-308	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R309-326	CARBONFILM RESISTOR	RD1/6PM□□□J
	R327, 328	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R351-361	CARBONFILM RESISTOR	RD1/6PM□□□J
	R363	CARBONFILM RESISTOR	RD1/6PM□□□J
	R365, 366	CARBONFILM RESISTOR	RD1/6PM□□□J
	R381-383	CARBONFILM RESISTOR	RD1/6PM□□□J
	R401-410	CARBONFILM RESISTOR	RD1/6PM□□□J
	R411, 412	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R413-416	CARBONFILM RESISTOR	RD1/6PM□□□J
	R417, 418	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R419-428	CARBONFILM RESISTOR	RD1/6PM□□□J
	R431, 432	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R433-452	CARBONFILM RESISTOR	RD1/6PM□□□J
	R453, 454	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R455-463	CARBONFILM RESISTOR	RD1/6PM□□□J
	R501, 502	CARBONFILM RESISTOR	RD1/6PM□□□J
	R503	CARBONFILM RESISTOR	RD1/2PMF□□□J
	R504-507	CARBONFILM RESISTOR	RD1/6PM□□□J
	R510	CARBONFILM RESISTOR	RD1/2LF□□□J
	R511, 512	CARBONFILM RESISTOR	RD1/6PM□□□J
	R514	CARBONFILM RESISTOR	RD1/4PM□□□J
	R515	CARBONFILM RESISTOR	RD1/6PM□□□J
	R517, 518	CARBONFILM RESISTOR	RD1/2PMF□□□J
	R541, 542	CARBONFILM RESISTOR	RD1/6PM□□□J
	R551-553	CARBONFILM RESISTOR	RD1/6PM□□□J
	R555-559	CARBONFILM RESISTOR	RD1/6PM□□□J
	R601, 602	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R603, 604	CARBONFILM RESISTOR	RD1/6PM□□□J
	R607, 608	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R609-612	CARBONFILM RESISTOR	RD1/6PM□□□J
	R613, 614	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R615, 616	CARBONFILM RESISTOR	RD1/6PM□□□J
	R617, 618	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R701	CARBONFILM RESISTOR	RD1/2PMF□□□J
	R703	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R705	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R709-712	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R741	CARBONFILM RESISTOR	RD1/2PMF□□□J
⚠	R742	FUSIBLE RESISTOR	RFA1/4L□□□J
	R743	METAL OXIDE RESISTOR	RS1LMF□□□J
	R751-759	CARBONFILM RESISTOR	RD1/6PM□□□J
	VR101, 102	VR	VRTS6VS472
	VR105, 106	(20K)	RCP1017
	VR281, 282	VR	VRTB6VS223
	VR351, 352	SEMI-FIXED RESISTOR	VRTB6VS103
	VR353	VR	VRTB6VS473
	VR401, 402	(20K)	RCP1017
	VR501	VR	VRTG6VS103
	VR502	VR	VRTG6VS473
	VR551, 552	VR	VRTG6VS473
	VR553, 554	VR	VRTB6VS472

OTHERS

CN31		B8P-SHF-1AA
JA31	JACK	RKN1014

Mark	No.	Description	Part No.
HEDPHONE UNIT			
SEMICONDUCTORS			
	IC901	OP-AMP, IC	M5218AP
CAPACITORS			
	C901, 902	ELECTR. CAPACITOR	CEYA010M50
	C903, 904	ELECTR. CAPACITOR(100/25)	PCH1076
	C907, 908	AXIAL CAPACITOR	CKPUYB221K50
RESISTORS			
	R901-906	CARBONFILM RESISTOR	RD1/6PM□□□J
	R907, 908	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R909, 910	CARBONFILM RESISTOR	RD1/6PM□□□J
	VR901	VARIABLE RESISTOR	RCV1043
OTHERS			
	JA51	JACK	RKN1019
POWER SW UNIT			
SWITCHES			
⚠	S991	SWITCH	RSA-063
CAPACITORS			
⚠	C991	CAPACITOR (0.01/AC400)	VCG-044
REC SW UNIT			
SWITCHES			
	S3	SWITCH	RSG-143
TAPE SELECTOR UNIT			
SWITCHES			
	S1, 2		RSH-070
CONNECTOR UNIT			
CAPACITORS			
	C1	CERAMIC CAPACITOR	CKCYF473Z50
RESISTORS			
	R4, 5	CARBONFILM RESISTOR	RD1/6PM□□□J
SENSOR UNIT (A)			
SEMICONDUCTORS			
	D1		GP1A51HR
CAPACITORS			
	C2	CERAMIC CAPACITOR	CKPUYY103N16
RESISTORS			
	R2	CARBONFILM RESISTOR	RD1/6PM□□□J

Mark	No.	Description	Part No.
SENSOR UNIT (B)			
SEMICONDUCTORS			
	D2		GP1A51HR
CAPACITORS			
	C3	CERAMIC CAPACITOR	CKPUYY103N16
RESISTORS			
	R3	CARBONFILM RESISTOR	RD1/6PM□□□J
DOOR SW UNIT			
SWITCHES			
	S4	SWITCH	RSK1002

6. ADJUSTMENTS

6.1 MECHANISM RELATED ADJUSTMENT

1. Tape Speed Adjustment

Mode	Adjustment Location	Specifications
PLAY	Capstan motor adjustment hole (Refer to Fig. 1.)	Adjust so that the playback frequency is 3000 ± 5 Hz at the beginning of winding of test tape STD-301.
PLAY		Playback test tape STD-301 again and confirm that the above specifications are satisfied.

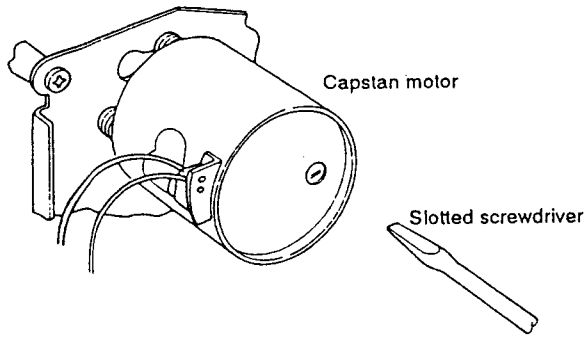


Fig. 1

2. Adjustment of Door Damper

Adjustment Location	Specifications
Cylinder adjustment screw (Refer to Fig. 2.)	Make sure that the door opens smoothly, there is no two-stage motion, and that there is no bounding when it opens completely. (Perform with no cassette half inserted.)

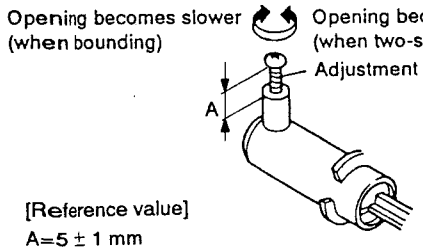


Fig. 2

3. Tape running and azimuth adjustment

No.	Mode	Adjustment Location	Specifications
1			Insert half mirror in side A (set screws at front).
2	PLAY	Height adjustment nut (Refer to Fig. 3.)	Playback the above tape and adjust so that there is no curling of the tape in the guide section of the head. (Refer to Fig. 4.)
3	PLAY	Azimuth adjustment screw (Refer to Fig. 3.)	Playback test tape STD-331B and adjust so that the 10 kHz output level is maximum and also so that there is no phase difference between L-ch and R-ch.
4	Check Item 2 above again and adjust again if it does not satisfy the specifications. (Be sure to adjust Item 3 when Item 2 is adjusted.)		

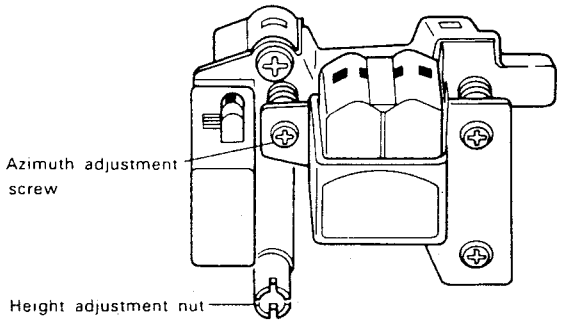


Fig. 3.

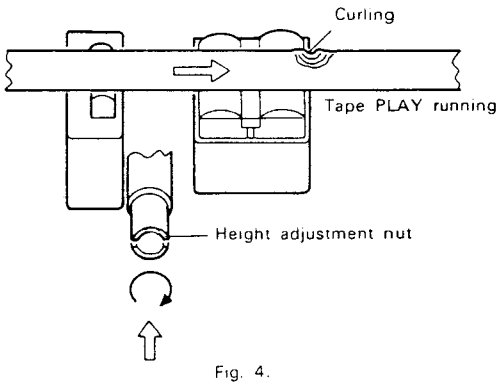


Fig. 4.

6.2 ELECTRICAL ADJUSTMENTS

Adjustment Conditions

1. The mechanical adjustments must be completed first.
2. The head must be cleaned and demagnetized.
3. Turn power on allow the deck to warm up for at least a few minutes before commencing any electrical adjustments.
4. The reference signal is 0 dBv=1 Vrms.
5. Connect a 50 kΩ (or between 47k to 52 kΩ) load resistance to the OUTPUT terminals.
6. Unless otherwise specified, the switches listed below are left in the positions indicated.
   DOLBY NR : OFF
   TAPE SELECTOR : NORM

Test Tapes

STD–331B : Playback adjustments (See Fig. 6–1)
STD–630 : NORMAL blank tape
STD–620 : CrO_2 blank tape
STD–610 : METAL blank tape

List of Adjustments

Playback sections

1. Head azimuth adjustment.
2. Playback level adjustment.
3. DC balance adjustment.

Recording sections

1. Bias oscillator adjustment.
2. Bias trap adjustment.
3. Recording bias adjustment.
4. Recording level adjustment.
5. Level meter check.
6. AUTO BLE adjustment.

NOTE: This unit has an automatic tape selection feature.

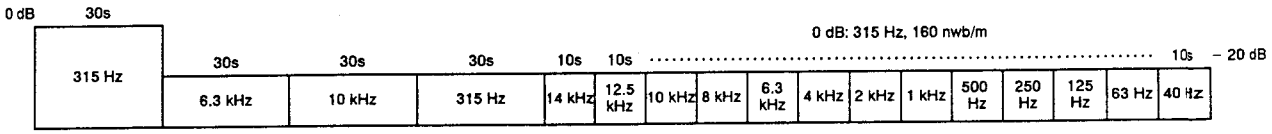


Fig. 6–1 Constants of the test tape STD–331B

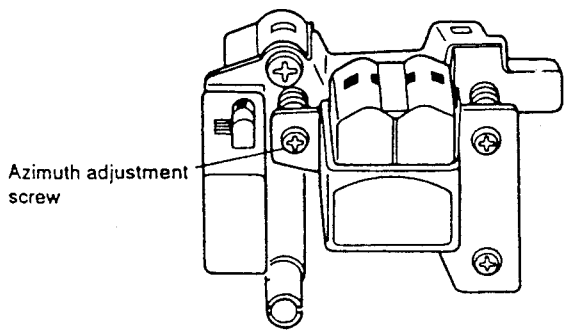


Fig. 6–2 Head azimuth adjustment

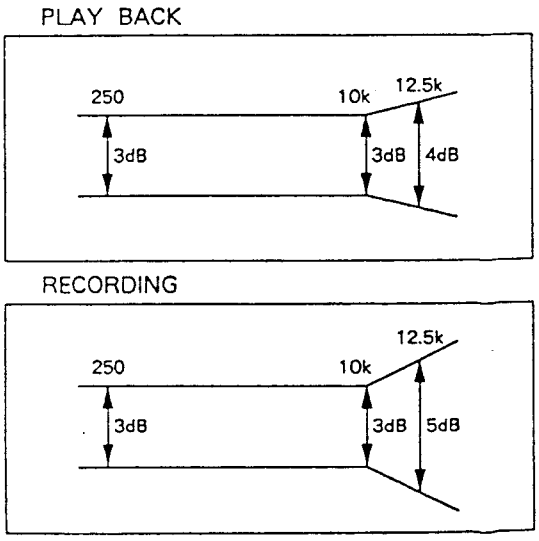


Fig. 6–3 Frequency response zone

PLAYBACK SECTION

1. Head Azimuth Adjustment

- Turn VR105, 106 to mechanical center positions.

No.	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1.	PLAY	Play the 10 kHz/–20 dB section of STD–331B test tape.	Head azimuth adjustment screw. (See Fig. 6–2)	LINE OUT	Maximum playback signal level.	
2.	STOP	Lock the screw with screw lock after completing adjustment.				

2. Playback Level Adjustment

- This adjustment determines the DOLBY NR level, and must be performed with great care.

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	PLAY	Play the 315 Hz/0 dB section of the STD–331B test tape.	Deck	VR105 (Lch) VR106 (Rch)	TP. 3 (Lch) TP. 4 (Rch)	–14.7 dBv	This adjustment must be performed accurately for proper Dolby level setting.

3. DC Balance Adjustment

No.	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1.			VR101 (Lch) VR102 (Rch)	TP. 21 (Lch) TP. 22 (Rch)	0V ± 0.2V	

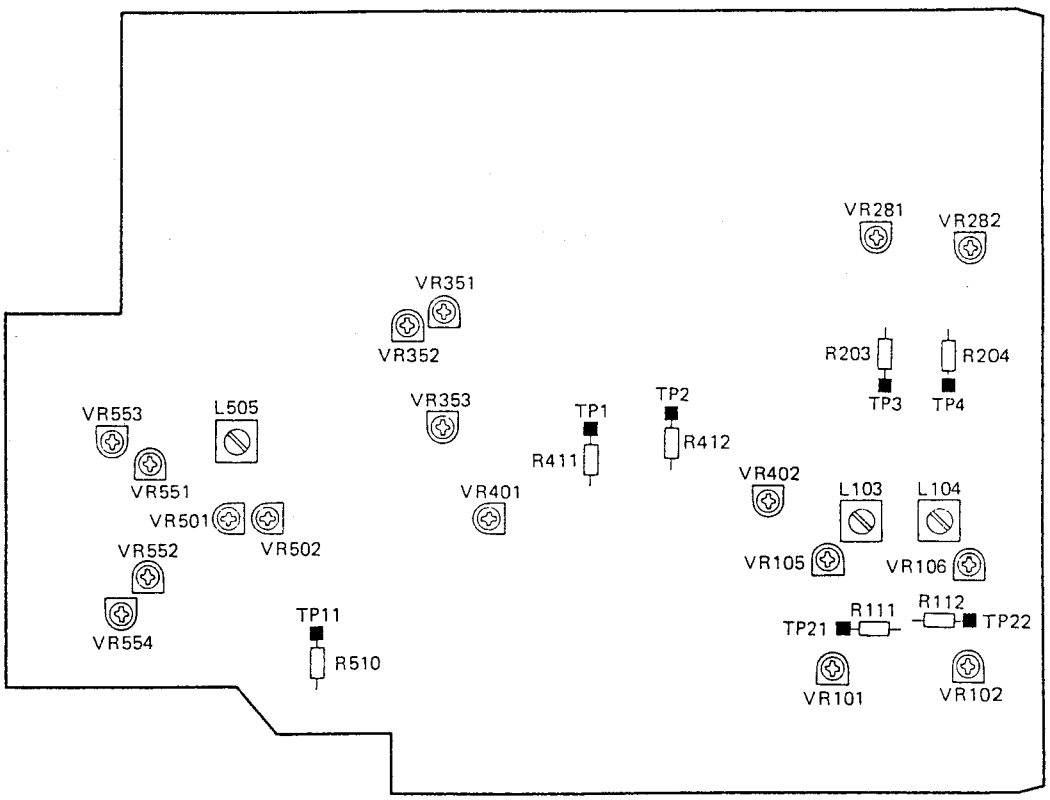


Fig. 6–4 Adjusting points

RECORDING SECTION

1. Bias Oscillator Adjustment

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	REC	Load the STD-610 test tape with no input signal.	Deck	L505	TP. 11	106 kHz ± 300 Hz	

2. Bias Trap Adjustment

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	REC	Load the STD-610 test tape with no input signal.	Deck	L103 (Lch) L104 (Rch)	TP. 3 (Lch) TP. 4 (Rch)	Minimum output	

3. Recording Bias Adjustment

- Turn ON the DOLBY HX PRO switch on the front panel, and set the BIAS control to the center position.

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	REC/ PAUSE	Apply a 315 Hz/-20 dBv (-20VU meter reading) signal to the line input terminals and insert STD-630.			LINE OUT		
2.	REC →PLAY	Record and play back the 315 Hz signal and a 10 kHz signal at -20 dBv input level.	NOR	VR551 (L)		Record and play back repeatedly, comparing the 315 Hz and 10 kHz playback levels, and adjust to 0±0.5 dB.	
				VR552 (R)			
3.		Record the 10 kHz/315 Hz, -20 dBv signal on STD-620 and play back.	CrO2	VR501 (L/R)		0 dBv ± 1.0 dB	
4.		Record the 10 kHz/315 Hz, -20 dBv signal on STD-610 and play back.	METAL	VR502 (L/R)		0 dBv ± 1.0 dB	
5.	Check distortion value after adjustment is completed and confirm that there is no underbias.						
6.	Turn OFF the DOLBY HX PRO switch.						
7.	REC →PLAY	Record and play back the 315 Hz signal and a 10kHz signal at -20 dBv input level.	NOR	VR553 (L)	LINE OUT	Turn the control fully counterclockwise, and gradually turn to the right to adjust to 0 dB ± 0.5 dB compared when HX-Pro is ON.	Turn control clockwise past the peakto assure proper overbias value.
				VR554 (R)			

4. Recording Level Adjustment

- Turn ON the DOLBY NR switch.

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	REC/ PAUSE	Apply the 315 Hz/0 dBv signal to the line input, and load STD-630 (NORM).	REC level control volume		TP. 3 (Lch) TP. 4 (Rch)	-15.2 dBv	
2.	REC →PLAY	Record and play back the 315 Hz/0 dBv signal.	Deck	VR401 (Lch)	TP. 3 (Lch) TP. 4 (Rch)	Repeatedly record, playback and adjust so that the playback signal level becomes -15.2 dB.	Recording bias adjustment and recording level adjustment with STD-630 must be performed accurately as reference for BLE adjustment.
				VR402 (Rch)			
3.	REC →PLAY	Record the 315 Hz/0 dBv signal on STD-620 (CrO2), and play it back.	Check			-15.2 dBv ± 1 dB	
4.	REC →PLAY	Record the 315 Hz/0 dBv signal on STD-610 (METAL), and play it back.	Check			-15.2 dBv ± 1 dB	

5. Level Meter Adjustment

No.	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1.	REC/ PAUSE	Apply a 315 Hz/–10 dBv (316 mV) signal to the line input terminals.	VR281 (Lch) VR282 (Rch)	TP. 1 (Lch) TP. 2 (Rch)	Always set the enlarged mode when adjusting. Adjust so that the 0 dB segment lights at a level of –15.2 ± 0.5 dBv (–15.2 ± 1.0 dBv in the normal mode).	Adjust by turning clockwise until the lamp lights up.

6. AUTO BLE Adjustment

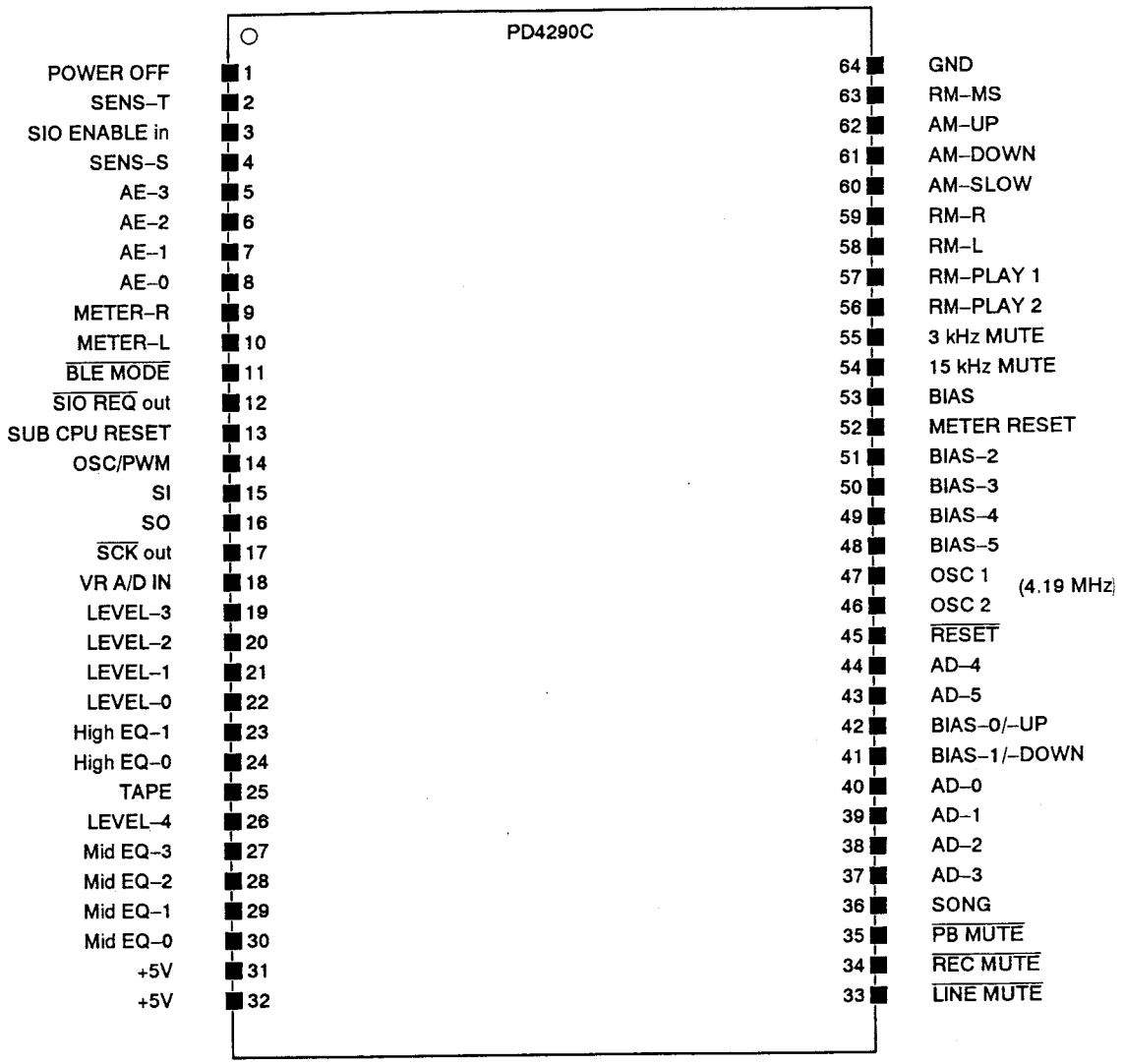
- BLE Adjustment must be performed after all other adjustments are completed.
- This adjustment should be performed in the test mode.
- Entering the test mode
  Press the MODE (COUNTER), RANGE and MONITOR keys on the front panel simultaneously, with the power ON. The unit enters the test mode and oscillates a 400 Hz signal.
  Thereafter, each time the START/CLEAR key is pressed, the oscillation frequency changes as follows: 3 kHz oscillation → 15 kHz oscillation → Release

No.	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1.	–	REC LEVEL VR MIN or no signal input.	–	–	–	
2.		Press the three keys MODE (COUNTER), RANGE and MONITOR on the front panel simultaneously.	VR351	Level meter Rch	Adjust so that –3 dB on the level meter lights.	400 Hz adjustment
3.		Press the START/CLEAR key once.	VR352		Adjust so that –1 dB on the level meter lights.	3 kHz adjustment
4.		Press the START/CLEAR key once.	VR353		Adjust so that –1 dB on the level meter lights.	15 kHz adjustment
5.	When the START/CLEAR key is pressed again, the test mode is released.					

7. IC DESCRIPTIONS

7.1 PD4290C

7.1.1 Main CPU Port Arrangement PD4290C (BLE & Main Control)



7.1.2 I/O Matrix Table

	CrO_2 (in) (Sub CPU)	METAL (in) (Sub CPU)	High EQ–1 (out) (Main CPU)	High EQ–0 (out) (Main CPU)
TAPE: NORMAL	L	L	1	0
TAPE: CrO_2	H	L	1	0
TAPE: METAL	L	H	0	1

- Output standard value for setting LEVEL (5bit) : 01111
  Mid EQ (4bit) : 0111
  High EQ (2bit) : According to the table above.

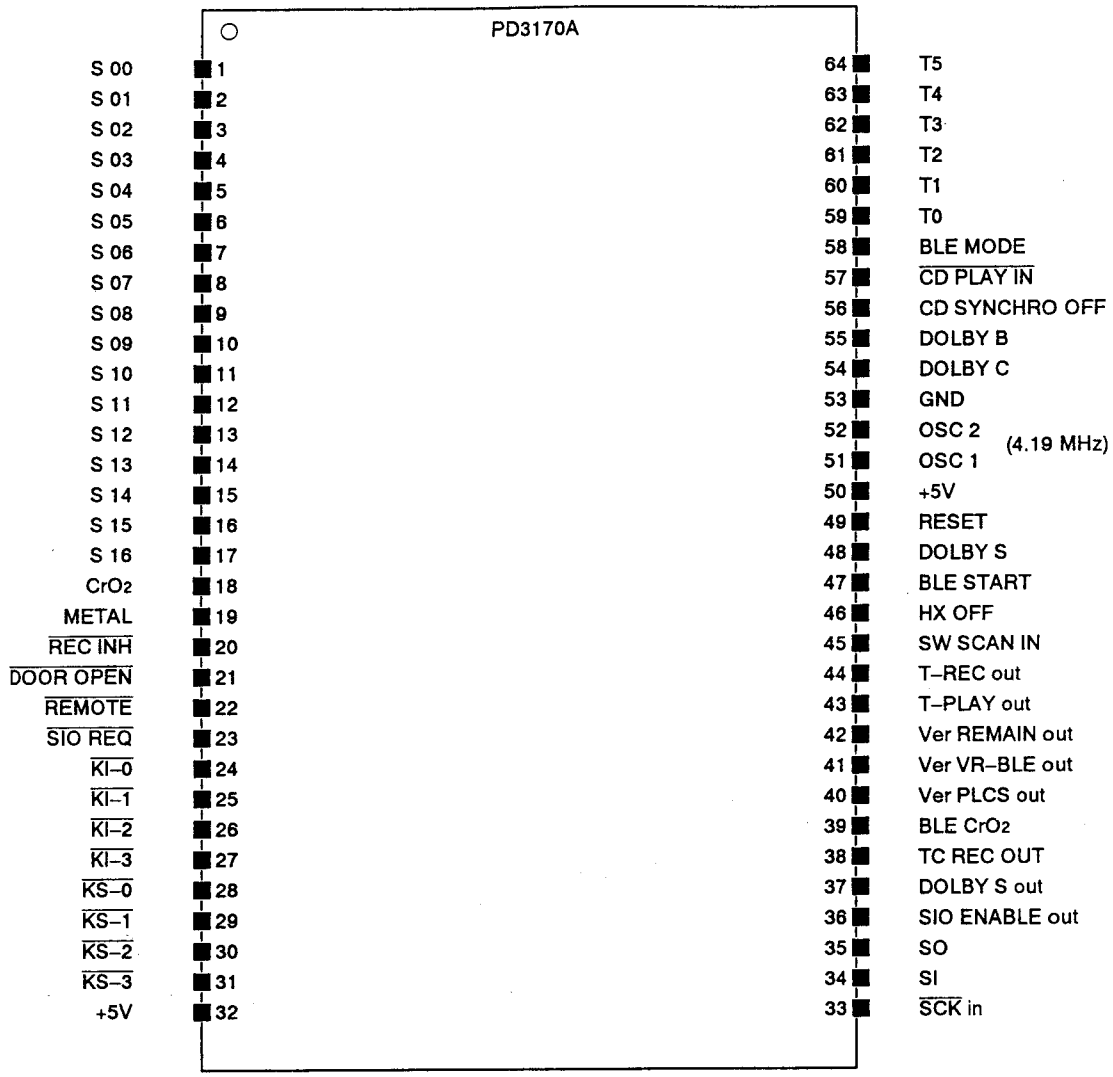
7.1.3 PD4290C Pin Functions

<table>
<tr><th>Pin No.</th><th>I/O</th><th>Name</th><th>Function</th></tr>
<tr><td>1</td><td rowspan="10">I</td><td>POWER OFF</td><td>POWER OFF trigger input and rising edge input when power is OFF. Normally "L".</td></tr>
<tr><td>2</td><td>SENS–T</td><td>Rotation pulse input for the take–up side reel base. The tape end is detected when the signal change stops. Also, ATLC operation is based on the signal change.</td></tr>
<tr><td>3</td><td>SIO ENABLE in</td><td>When this signal from the sub CPU becomes "H", the main CPU starts communication with the sub CPU.</td></tr>
<tr><td>4</td><td>SENS–S</td><td>Rotation pulse input for the supply side reel base. When Ver REMAIN is ON, the operation for the remain function is performed by this signal. Also, when the signal change stops for 5 minutes with Ver REMAIN ON, PLAY or REC/PLAY mode changes to STOP mode.</td></tr>
<tr><td>5</td><td>AE–3</td><td rowspan="4">4–bit encoder input for position detection of the mechanism.
<table><tr><th>4–bit data</th><th>Mechanism mode</th></tr><tr><td>0000</td><td>PLAY, REC/PLAY</td></tr><tr><td>0010</td><td>PLAY/PAUSE, REC/PAUSE</td></tr><tr><td>0111</td><td>CUE, REVIEW</td></tr><tr><td>0100</td><td>STOP, PAUSE</td></tr><tr><td>1101</td><td>FF. REW</td></tr><tr><td>1001</td><td>EJECT</td></tr></table></td></tr>
<tr><td>6</td><td>AE–2</td></tr>
<tr><td>7</td><td>AE–1</td></tr>
<tr><td>8</td><td>AE–0</td></tr>
<tr><td>9</td><td>METER–R</td><td rowspan="2">Input of results from comparison of 6–bit output (AD–0 through AD–5) with both R and L channels.</td></tr>
<tr><td>10</td><td>METER–L</td></tr>
<tr><td>11</td><td rowspan="4">O</td><td>$\overline{\text{BLE MODE}}$</td><td>"L" is output during BLE tuning mode and test mode, and "H" is output at other times.</td></tr>
<tr><td>12</td><td>$\overline{\text{SIO REQ}}$ out</td><td>"L" is output when main CPU requests communication with sub CPU, and "H" is output at other times.</td></tr>
<tr><td>13</td><td>SUB CPU RESET</td><td>Reset output for resetting of sub CPU when power is turned ON/OFF and when the communication between main CPU and sub CPU is interrupted for a certain duration.</td></tr>
<tr><td>14</td><td>OSC/PWM</td><td>Tuning oscillator output in BLE mode, and at other times PWM output for position detection of the input volume.</td></tr>
<tr><td>15</td><td>I</td><td>SI</td><td>Serial input for communication with sub CPU.</td></tr>
<tr><td>16</td><td rowspan="2">O</td><td>SO</td><td>Serial output for communication with sub CPU.</td></tr>
<tr><td>17</td><td>$\overline{\text{SCK}}$ out</td><td>Clock pulse output for communication with sub CPU.</td></tr>
<tr><td>18</td><td>I</td><td>VR A/D IN</td><td>Input of results from comparison of PWM smoothed level signal and position detection level signal of the input volume.</td></tr>
<tr><td>26</td><td rowspan="11">O</td><td>LEVEL–4</td><td rowspan="5">BLE 5–bit LEVEL output.</td></tr>
<tr><td>19</td><td>LEVEL–3</td></tr>
<tr><td>20</td><td>LEVEL–2</td></tr>
<tr><td>21</td><td>LEVEL–1</td></tr>
<tr><td>22</td><td>LEVEL–0</td></tr>
<tr><td>23</td><td>High EQ–1</td><td rowspan="2">BLE 2–bit High EQ output.</td></tr>
<tr><td>24</td><td>High EQ–0</td></tr>
<tr><td>25</td><td>TAPE</td><td>Tape monitor output. Tape when "H", source when "L".</td></tr>
<tr><td>27</td><td>Mid EQ–3</td><td rowspan="4">BLE 4–bit Mid EQ output.</td></tr>
<tr><td>28</td><td>Mid EQ–2</td></tr>
<tr><td>29</td><td>Mid EQ–1</td></tr>
<tr><td>30</td><td>Mid EQ–0</td></tr>
<tr><td>33</td><td>$\overline{\text{LINE MUTE}}$</td><td>Mute control output for LINE OUT. Muting is ON when "L".</td></tr>
<tr><td>34</td><td>$\overline{\text{REC MUTE}}$</td><td>Mute control output for recording signal. Muting is ON when "L".</td></tr>
<tr><td>35</td><td>$\overline{\text{PB MUTE}}$</td><td>Mute control output for playback signal. Muting is ON when "L".</td></tr>
</table>

<table>
<tr><th>Pin No.</th><th>I/O</th><th>Name</th><th>Function</th></tr>
<tr><td>36</td><td>I</td><td>SONG</td><td>Blank detection signal input. Blank when "L".</td></tr>
<tr><td>43</td><td rowspan="14">O</td><td>AD–5</td><td rowspan="6">6–bit compensation level signal output for meter A/D.</td></tr>
<tr><td>44</td><td>AD–4</td></tr>
<tr><td>37</td><td>AD–3</td></tr>
<tr><td>38</td><td>AD–2</td></tr>
<tr><td>39</td><td>AD–1</td></tr>
<tr><td>40</td><td>AD–0</td></tr>
<tr><td>41</td><td>BIAS–DOWN</td><td rowspan="2">Control output for BLE power drive bias volume when Ver VR–BLE is ON. When DOWN is "L" and UP is "H", the volume rotates clockwise and the bias current increases. When DOWN is "H" and UP is "L", the volume rotates counterclockwise and the bias current decreases. The power drive bias volume stops when the output status is "L", "L" or "H", "H".</td></tr>
<tr><td>42</td><td>BIAS–UP</td></tr>
<tr><td>45</td><td>I</td><td>$\overline{\text{RESET}}$</td><td>Reset input for main CPU. Reset when "L"; programming starts when "L" → "H".</td></tr>
<tr><td>48</td><td>BIAS–5</td><td rowspan="4">Not used when Ver VR–BLE is ON.</td></tr>
<tr><td>49</td><td>BIAS–4</td></tr>
<tr><td>50</td><td>BIAS–3</td></tr>
<tr><td>51</td><td>BIAS–2</td></tr>
<tr><td>52</td><td>METER RESET</td><td>Used to speed up A/D operation in BLE mode. Meter circuit is discharged when "H".</td></tr>
<tr><td>53</td><td>BIAS</td><td>Control output for bias ON/OFF during recording. Bias is ON when "H".</td></tr>
<tr><td>54</td><td>15 kHz MUTE</td><td rowspan="2">Used in accordance with the test signal for BLE tuning. Muting is ON when "H". Both are ON when the signal is 400 Hz. Only 15 kHz MUTE is ON when the signal is 3 kHz. Both are OFF when the signal is 15 kHz.</td></tr>
<tr><td>55</td><td>3 kHz MUTE</td></tr>
<tr><td>56</td><td>RM–PLAY 2</td><td rowspan="4">For PLAY and REC (L) mode, PLAY torque is lowered only for the first 5 to 15 minutes of tape winding. During tape return and BLE rewind, tape speed is varied using the control lines of PLAY–2, PLAY–1 and MS.
<table>
<tr><th>Mechanism mode</th><th>PLAY–2</th><th>PLAY–1</th><th>MS</th><th>L</th><th>R</th></tr>
<tr><td>FF</td><td>L</td><td>L</td><td>L</td><td>L</td><td>H</td></tr>
<tr><td>REW</td><td>L</td><td>L</td><td>L</td><td>H</td><td>L</td></tr>
<tr><td>CUE</td><td>L</td><td>L</td><td>H</td><td>L</td><td>H</td></tr>
<tr><td>REVIEW</td><td>L</td><td>L</td><td>H</td><td>H</td><td>L</td></tr>
<tr><td>PLAY, REC (H)</td><td>H</td><td>L</td><td>L</td><td>L</td><td>H</td></tr>
<tr><td>PLAY, REC (L)</td><td>H</td><td>H</td><td>L</td><td>L</td><td>H</td></tr>
<tr><td>STOP, PAUSE, PLAY/PAUSE, REC/PAUSE</td><td>–</td><td>–</td><td>–</td><td>H</td><td>H</td></tr>
</table></td></tr>
<tr><td>57</td><td>RM–PLAY 1</td></tr>
<tr><td>63</td><td>RM–MS</td></tr>
<tr><td>58</td><td>RM–L</td></tr>
<tr><td>59</td><td>RM–R</td></tr>
<tr><td>60</td><td>AM–SLOW</td><td rowspan="3">Assist motor control output. When DOWN is "L" and UP is "H", the mechanism raises the head base, and when DOWN is "H" and UP is "L" it lowers the head base for ejection of the tape. SLOW output is set to "H" only during the servo operation after one assist motor operation and during the assist motor operation between the EJECT and STOP mode.</td></tr>
<tr><td>61</td><td>AM–DOWN</td></tr>
<tr><td>62</td><td>AM–UP</td></tr>
</table>

7.2 PD3170A

7.2.1 Sub CPU Port Arrangement PD3170A (Display and Key Input)



7.2.2 Input Matrix Table

("L" active for all.)

	KI 3	KI 2	KI 1	KI 0	
KS3	REW	OPEN/CLOSE	STOP	TAPE RETURN	Detection is possible when the scanning is OFF.
KS2	PLAY	COUNTER MODE	COUNTER RESET/ CAPACITY	DISPLAY	
KS1	FF	METER RANGE	REC	PEAK MODE	
KS0	PAUSE	MONITOR	REC MUTE	CD SYNCHRO	

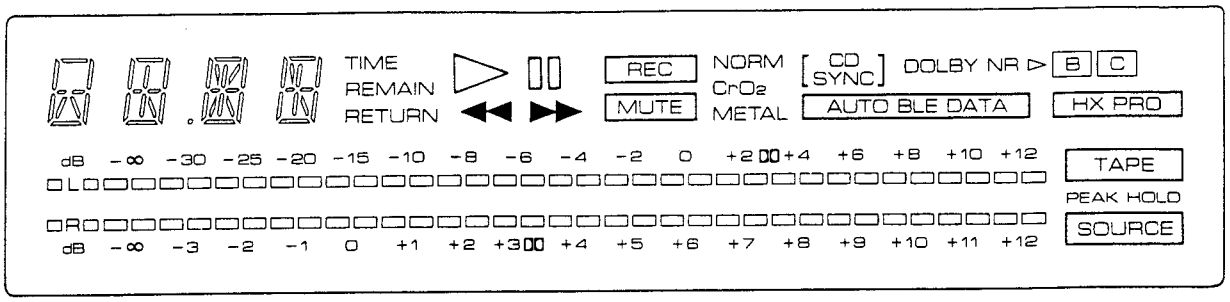
- For the input matrix, a key is ON when 1 port of either KS3 through KS0 is "L", and KI–0, 1, 2, and 3 are "L".
- A switch is ON when 1 port of either T–REC, T–PLAY, Ver REMAIN, Ver VR–BLE or Ver PLCS is "H", and SW SCAN IN is "H". However, the input of these 5 lines is performed for 4 sec. after the power is turned ON, and thereafter only T–PLAY is input except during BLE test mode.

7.2.3 PD3170A Pin Functions

Pin No.	Name	Function
1	S00	S01 through S16 are FL segment outputs.
2	S01	
3	S02	
4	S03	
5	S04	
6	S05	
7	S06	
8	S07	
9	S08	
10	S09	
11	S10	
12	S11	
13	S12	
14	S13	
15	S14	
16	S15	
17	S16	
18	CrO_2	Input for CrO_2 switch for cassette half. Switch is ON when "H".
19	METAL	Input for METAL switch for cassette half. Switch is ON when "H".
20	RECINH	Input for REC protection switch for cassette half. Recording is disabled when "L".
21	DOOR OPEN	Door switch input. Door open when "L".
22	REMOTE	Remote control signal input. Serial communication request input from the main CPU. "L" is output when
23	SIO REQ	communication is requested, and "H" is output at other times.
24	KI3	KI0 through KI3 are key scan return signal inputs. Key is ON when "L".
25	KI2	
26	KI1	
27	KI0	
28	KO3	KO0 through KO3 are key scan signal outputs. "L" is output during scanning.
29	KO2	
30	KO1	
31	KO0	
32	Vcc	Power supply terminal, +5V.

Pin No.	Name	Function
33	SCKIN	Serial communication clock pulse input.
34	SI	Serial communication data input.
35	SO	Serial communication data output.
36	BUSY	Serial communication enable signal output. Communication is enabled when "H".
37	NRSO	Dolby S control signal output. Dolby S is ON when "H".
38	SYNO	PLAY request signal output from the deck to the CD player for CD synchronization. Deck REC state when "H".
39	CREQ	EQ control output during BLE. "H" is output during the BLE tuning with a CrO_2 tape or when AUTO BLE DATA lights.
40	PLCSV	When pins 40 through 44 output "H" and if the result input at 45 is "H", presence of diode and switch ON is detected. PLCS version diode scan output.
41	BLE TYPE	VR-BLE version diode scan output.
42	REMAINV	REMAIN version diode scan output.
43	T-PLAY	Timer PLAY switch scan output.
44	T-REC	Timer REC switch scan output.
45	SW SCAN IN	Switch scan return input. Scanned switch is ON when "H".
46	HXOF	Not used.
47	BLE	BLE start switch input. Switch is ON when "L" → "H".
48	NRSI	Dolby S switch input. Switch is ON when "H".
49	RESET	RESET signal input. Reset when "H"; programming starts when "H" → "L".
50	TEST	Not used. Connected to VCC potential.
51	OSC1	4.19 MHz ceramic resonator is connected between OSC1 and OSC2.
52	OSC2	
53	GND	GND terminal
54	NRCI	Dolby C switch input. Switch is ON when "H".
55	NRBI	Dolby B switch input. Switch is ON when "H".
56	SYOF	Jack connection detection of the CD synchronization cord. No connection when "H".
57	SYNI	PLAY signal input during CD synchronization. CD PLAY when "L".
58	NROFF	Dolby is set to OFF during BLE. Dolby OFF when "H".
59	T0	T0 through T5 are FL grid outputs.
60	T1	
61	T2	
62	T3	
63	T4	
64	T5	

7.3 FL



7.3.1 Connection Terminals

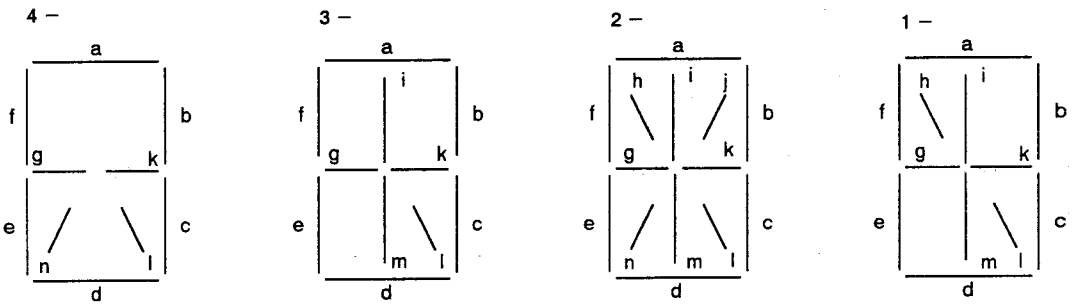
TERMINAL No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
ELECTRODE	F	F	NP	NP	(T0)	(T1)	(T2)	(T3)	(T4)	(T5)	(ALL)	(S00)	(S01)	(S02)	(S03)	(S04)				
TERMINAL No.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
ELECTRODE	NP	(S05)	(S06)	(S07)	NP	(S08)	(S09)	(S10)	(S11)	(S12)	(S13)	(S14)	(S15)	NP	NP	(S16)	NP	NP	NP	NP
TERMINAL No.						37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
ELECTRODE						NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	F	F

Notes F : Filament NP: No Pin

7.3.2 FL Matrix Table

	T0	T1	T2	T3	T4	T5
S00	3-a	2-a	1-a	S	L-0	R-0
S01	3-b	2-b	1-b	C	L-1	R-1
S02	3-i+m	2-i	1-i+m	B	L-2	R-2
S03	3-f	2-h	1-h+l	HX PRO	L-3	R-3
S04	3-g+k	2-j	1-k	DOLBY NR ▶	L-4	R-4
S05	3-c	2-f	1-f	(CD SYNC)	L-5	R-5
S06	3-l	2-g	1-g	AUTO BLE DATA	L-6	R-6
S07	3-e	2-k	1-c	NORM	L-7	R-7
S08	3-d	2-c	1-e	CrO_2	L-8	R-8
S09	4-a	2-n	1-d	METAL	L-9	R-9
S10	4-b	2-l	▮▮ (PAUSE)	REC	L-10	R-10
S11	4-f	2-m	▶ (PLAY)	MUTE	L-11	R-11
S12	4-g+k	2-e	TIME	TAPE	L-12	R-12
S13	4-c	2-d	REMAIN	HOLD	L-13	R-13
S14	4-l+n	●	▶▶ (FF)	PEAK	L-14	R-14
S15	4-e		◀◀ (REW)	SOURCE	L-15	R-15
S16	4-d		RETURN		NORMAL RANGE SCALE	EXPAND RANGE SCALE
ALL					-L- - -	-R- - -

- Of the 4 digits of the 7 segment display the leftmost digit is 4–, and the rightmost digit is 1–.



- 7 segment display indications other than numbers are as shown below.

7.3.3 Character Display

Dispaly	Display condition
WAIT	Lights for 4 sec. at POWER ON.
REC	Blinks for 4 sec. with TIMER REC switch ON at POWER ON.
OPEN	Lights for 4 sec. when the mechanism ejects.
CAL	Lights during the BLE tuning operation.
ERR	Blinks when the BLE tuning is not completed.
P- --	The data "00" through "15" light during the skip search operation.
P+ --	
C60	Lights or blinks during detection of tape length, when the counter is set to remain mode, until the results are displayed.
C46L	
C90	
C80L	

8. SPECIFICATIONS

System ..... 4 track, 2-channel stereo
Heads
Recording and playback head:
[CT-93, CT-979]
Laser amorphous playback head and Laser amorphous recording head combination × 1
[CT-900S, CT-777]
Hard permalloy playback head and Hard permalloy recording head combination × 1
Erasing head: Ferrite head with sendust gurd × 1
Motor ..... DC servo capstan motor × 1
DC reel motor × 1
DC auxiliary motor × 1
Wow and Flutter
[CT-93, CT-979] ..... No more than 0.022% (WRMS)
No more than ±0.052% (DIN)
[CT-900S, CT-777] ..... No more than 0.023%(WRMS)
No more than ±0.056% (DIN)
Fast Winding Time ..... Approximately 75 seconds
(C-60 tape)

Frequency Response
−20 dB recording:
[CT-93, CT-979]
Metal tape ..... 15 to 22,000 Hz
Chrome tape ..... 15 to 21,000 Hz
Normal tape ..... 15 to 21,000 Hz
Signal-to-Noise Ratio (Dolby NR off)
[CT-93, CT-979] ..... More than 61 dB
Noise Reduction Effect
Dolby B-type NR ON ..... More than 10 dB (at 5 kHz)
Dolby C-type NR ON ..... More than 19 dB (at 5 kHz)
Dolby S-type NR ON (CT-93, CT-900S) .... More than 22 dB (at 5 kHz)
Harmonic Distortion ..... No more than 0.6% (0 dB)
Input (Sensitivity)
LINE (INPUT) ..... 60 mV (Input impedance 47 kΩ)
Output (Reference level)
LINE (OUTPUT) ..... 316 mV (Output impedance 1.8 kΩ)
Headphone ..... 2.3 mW
(Load impedance 8 Ω, PHONES LEVEL control max.)

Subfunctions

- Super AUTO BLE system
- Bias control with motor driven (CT-93, CT-979)
- Dolby HX Pro Headroom Extension system
(CT-93, CT-979: on/off possible)
- Dolby S-type noise reduction system (CT-93, CT-900S)
- Dolby B-type and C-type noise reduction systems
- MPX filter
- Level meter with 2 modes peak hold selection (16 + 1 segments)
- Level meter range selection (wide/expanded)
- Peak level calibration system (CT-93, CT-979)
- 4-digit electronic tape counter with mode selection
(CT-93, CT-979: Normal/Time/Remain time)
- Auto monitor selection (Tape/Source)
- Display off
- Music search (over ±15 selections)
- Automatic Tape Loose Canceller (ATLC)
- Tape return/Return play
- Auto space recording mute
- Auto tape selector
- Playback/recording timer start function
- CD•DECK SYNCHRO recording
- Headphones jack with level control
- Power eject (Open/Close)
- Repeat playback
- System remote control available (Multi-voltage model of CT-93)

Miscellaneous

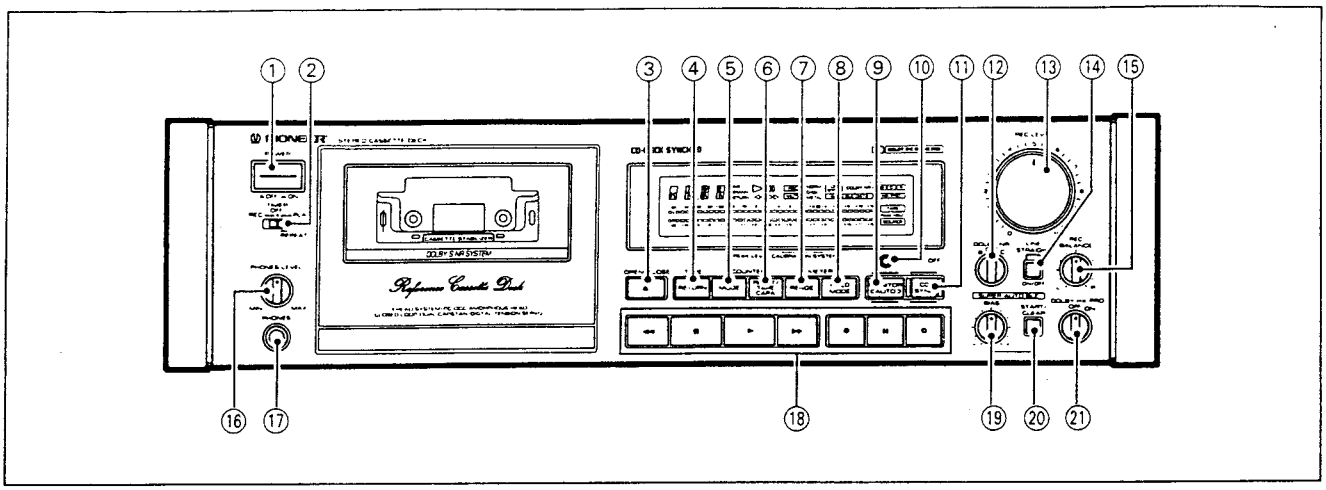
Power Requirements
European model ..... AC 220−230 Volts~, 50/60 Hz
U.K. model ..... AC 230−240 Volts~, 50/60 Hz
Multi-voltage model ..... AC 110/120−127/220/240 V (switchable), 50/60 Hz
Power Consumption
[CT-979] 20W
Dimensions
[CT-979, CT-900S, CT-777] ..... 420(W) × 135(H) × 370(D) mm
Weight (without package)
[CT-979] ..... 8.2 kg

Accessories

Operating instructions 1
Connection cord with pin plugs 2
CD•DECK SYNCHRO control cord 1
Remote control cord (Multi-voltage model of CT-93) 1

NOTE:
Specifications and design subject to possible modifications without notice, due to improvements.

9. PANEL FACILITIES



① **Power switch (POWER ■ OFF/▬ ON)**

② **Timer mode/repeat play switch (TIMER REC/OFF/PLAY-REPEAT)**

③ **Open/close button (OPEN/CLOSE ⏏)**

Press this button to open or close the cassette door. Whenever inserting or removing a cassette tape, be sure that the power is turned ON.

NOTE:

If the cassette door is closed while the unit is turned OFF, and the power is then turned ON, the cassette door may open and close after pressing one of the operation buttons. This occurs when the microprocessor resets the door mechanism to its initial state and does not indicate any malfunctioning of the unit.

④ **Tape return button (TAPE RETURN)**

This button is used in the normal tape counter mode to fast forward or rewind the tape to a point near the counter reading "0000."

⑤ **Counter mode button (COUNTER MODE)**

[CT-93, CT-979]

Each time this button is pressed, one of the three mode (Normal tape counter/Time counter/Remaining time counter) is set in sequence.

⑥ **[CT-93, CT-979]**

Counter reset/Tape capacity selector button (COUNTER RESET/TAPE CAPA)

Reset the counter indication to "0000" in the normal tape counter or the time counter mode.

To indicate the correct time value in the remaining time counter mode, this button must be set in accordance with the tape used.

⑦ **Level meter range selector button (METER RANGE)**

Selects wide or expanded range for the level meter.

⑧ **Level meter hold mode button (METER HOLD MODE)**

Selects the display mode of the peak level.

When press this button so that the HOLD indicator lights up, the level meter holds the maximum level indications of the signal. To erase the maximum level indications, press this button again. When the HOLD indicator goes off, the level meter holds peak indications for about 1.2 second.

⑨ **Monitor selector button (MONITOR [AUTO])**

Used to monitor the source sound or just recorded sound during recording.

- When the unit is set to record or playback mode, the TAPE indicator light up and the monitor mode is automatically selected.

⑩ **Display off button (DISPLAY OFF)**

Press this button to turn off the function display.

⑪ **CD•DECK SYNCHRO recording button (CD SYNC)**

⑫ **DOLBY* NR switch**

[CT-979, CT-777]

3-position (B/OFF/C)

*

- *Dolby noise reduction and HX Pro headroom extension manufactured under license from Dolby Laboratories Licensing Corporation. HX Pro originated by Bang & Olufsen.*
- *"DOLBY", the double-D symbol ◻◻ and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.*

⑬ **Recording level control (REC LEVEL)**

⑭ **[CT-93, CT-979 only]**

Line straight button/indicator (LINE STRAIGHT)

When press this button so that the indicator lights up, the signal is passed the REC BALANCE control circuits.

⑮ **Recording balance control (REC BALANCE)**

⑯ **Headphones level control (PHONES LEVEL)**

⑰ **Headphones jack (PHONES)**

⑱ **Operation buttons**

- ◀◀: Rewind/music search
- ■ : Stop
- ▶ : Playback
- ▶▶: Fast forward/music search
- ● : Recording
- ▮▮ : Pause
- O : Recording mute

⑲ **[CT-93, CT-979 only]**

Recording bias control/indicator (BIAS)

If you desire, you can readjust the recording bias condition after the AUTO BLE tuning.

⑳ **SUPER AUTO BLE button (START/CLEAR)**

㉑ **[CT-93, CT-979 only]**

DOLBY HX PRO switch (OFF/ON)